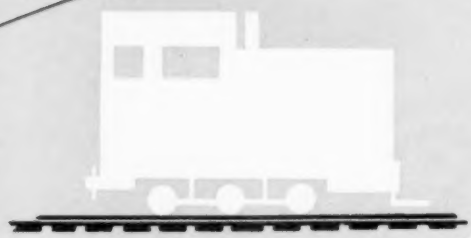
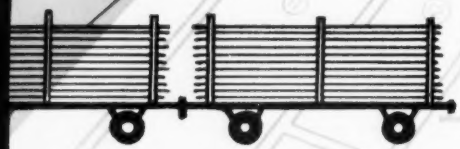
FEBRUARY 8, 1954

STEEL

THE WEEKLY MAGAZINE OF METALWORKING





On Industry's Network . . .

MEGACYCLES MOVE MATERIALS

— page 108

✓ **THE 1954 AUTOMOBILES**
What You Get for Your Money, p. 82

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What Mr. Tubes Can Do For You

—about pressure tubing

When it comes to pressure tubing, you're wise to talk to somebody who knows your problems. Mr. Tubes, your nearby B&W Tube Representative, serves the oil, chemical and power industries . . . and related fields . . . faithfully and efficiently. He is constantly concerned with tubing problems his customers encounter, and he devotes a lot of his time to helping find the right answers to questions of pressure and temperature.

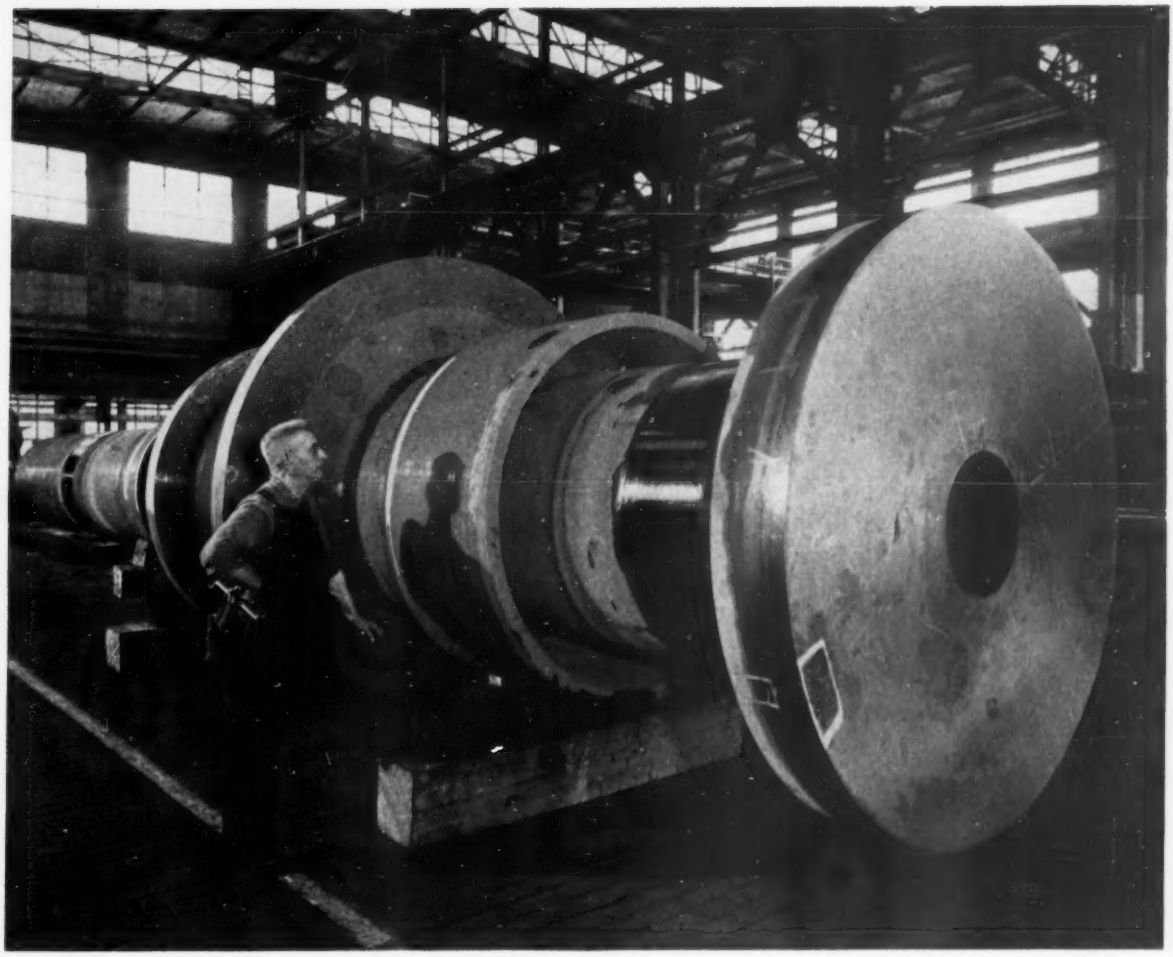
Mr. Tubes can do a lot for you. Next time pressure tubing is on your mind, call on him.

B&W STAINLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

Beaver Falls, Pa.—Stainless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

TA-1802(P)



HUGE SHAFT TO BE PART OF HYDROELECTRIC PLANT AT McNARY DAM

This is a 96-ton water-wheel generating shaft that will see service in the hydroelectric plant of the big McNary Dam across the Columbia River. The shaft is one of a group being forged and machined by Bethlehem for this great power and flood-control project.

Bethlehem has made some heavier shafts, but few that were any more complex. As the picture shows, it is a tapered job, with the shaft proper ranging in outside diameter from 30 to 36 in. The large bearing flange near the center is 94 in. in diameter.

From an overall standpoint, the forging is a good example of the heavyweights our shops so often handle. But we also make some midgets—pieces weighing as little as an ounce. You can call upon Bethlehem for all kinds of forgings—closed-die, hammer, and press—and you will find them well made, the kind that consistently stand up in heavy-duty service.

We are always glad to talk forgings . . . so why not give us a ring the next time you're in the market? Remember, we make the full range, from drop forgings on up, and we can machine to your specifications.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

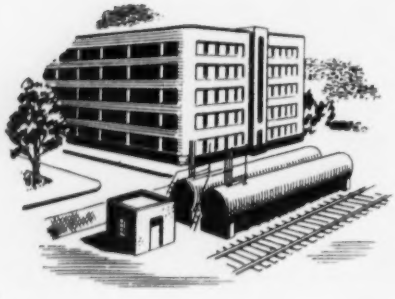
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

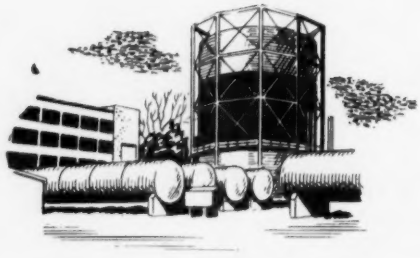
BETHLEHEM STEEL

America's Largest Selling Brand of LP-Gas

PHILGAS*!

CLEAN, UNIFORM HEAT FOR INDUSTRIES *AND* UTILITIES





PHILGAS BENEFITS: This top-quality Phillips *66* butane-propane fuel is uniform in thermal value and gravity. Free from harmful contaminants, it burns *clean!* Automatic operation cuts down on overhead, assures constant furnace temperatures, atmospheres and pressures.

PHILGAS USES: Leading industries use Philgas successfully for heat treating, mold drying, core baking, ceramic firing and many other operations. Many progressive utilities also find it advantageous to augment their natural or manufactured gas output with clean-burning, reliable Philgas.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas.

Phillips 66 Philgas
THE ALL-PURPOSE FUEL

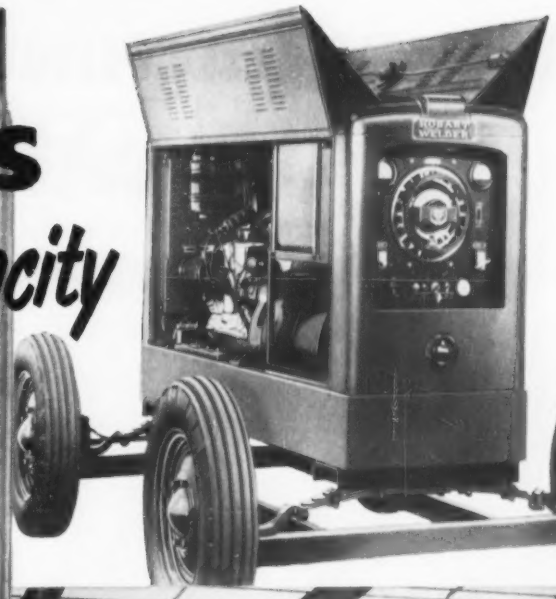
PHILLIPS PETROLEUM COMPANY
Sales Department · Bartlesville, Oklahoma

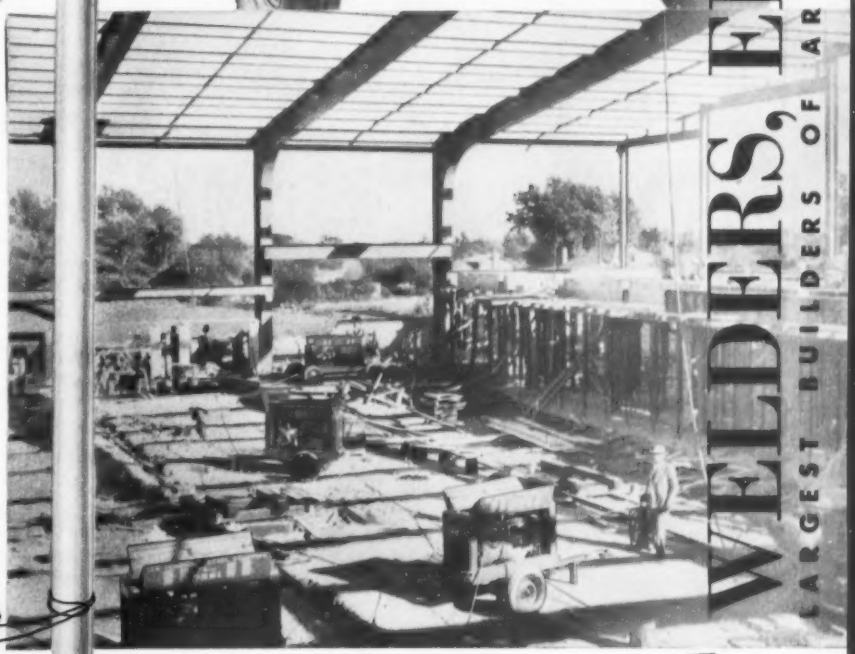
Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kans.

Hobart's extra welding capacity

(Added turns of extra copper.)

...helps you get more welding per man hour



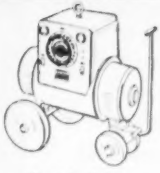


Advanced engineered Hobart welders are never skimped of quality materials . . . you get constant top performance insuring cooler operation, easier arc control, extra capacity. Hobart simplified arc welders will speed up production and cut costs even on the toughest jobs, and your weldors will be putting out more work with fewer rejects and less effort. If you're looking for a rugged welder that will give better performance at less expense, try Hobart . . . see the difference for yourself.

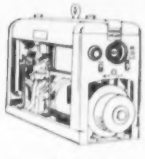
HOBART No. 10 E-6010

An outstanding electrode for all-around welding

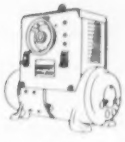
The Hobart "10" is an all-position, general purpose electrode, ideal for pipe lines, structural steel, boilers, tanks, shipbuilding, freight cars, etc. Gives stronger welds, deeper penetration and less spatter.



Electric Drive DC Welder



"Pipeliner" Gas Drive DC Welder



"Bantam Champ" Electric Drive DC Welder

HOBART WELDERS, ELECTRODES

ONE OF THE WORLD'S LARGEST BUILDERS OF ARC WELDING EQUIPMENT

free!

☐ "HOW TO GET BETTER WELDS." Valuable vest pocket booklet.

Hobart
brothers company
box ST-24, Troy, Ohio
Phone 21223

HOBART BROTHERS COMPANY, BOX ST-24, TROY, OHIO

Without obligation, please send information on items checked.

☐ Gas Drive Welder ☐ Electric Drive Welder
☐ Pipeliner Welder ☐ Bantam Champ Welder

Send me—☐ Electrode Catalog ☐ Accessories Catalog

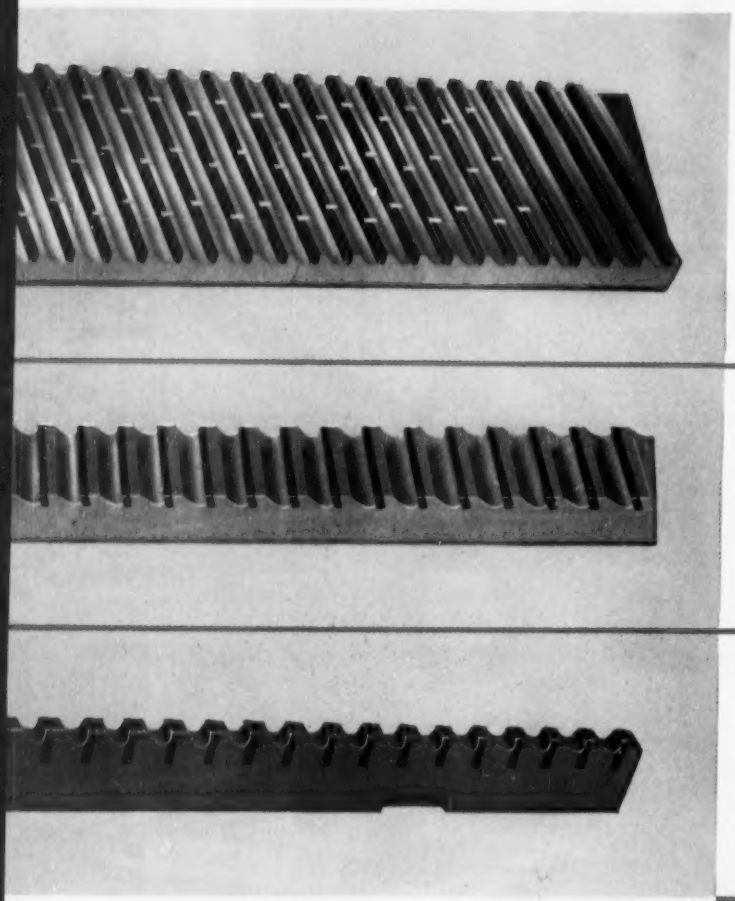
NAME _____ POSITION _____

FIRM _____

ADDRESS _____

WHEN BROACHING...

SAVE WITH CARBIDES



With Continental Carbide tipped broaches you'll get more pieces per grind, more pieces per broach, and more pieces per dollar. They are especially effective on cast iron parts.

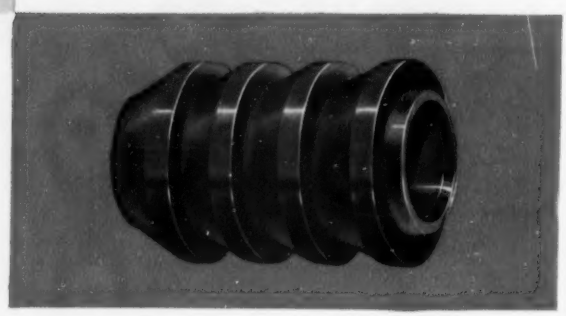
Carbide tips may be used in all the broach teeth or in the finishing teeth only. Continental Tool Works Division of Ex-Cell-O has the technical knowledge to help you; Continental has been designing and building solid carbide and carbide tipped cutting tools since 1930.

For information regarding your application, or for a quotation on carbide tipped broaches, just give your local Ex-Cell-O representative the details or write to Continental in Detroit.

TOP: Carbide tipped sections of a Continental Surface Broach. Note the chip breaker grooves in the semi-finishing teeth and the solid finishing teeth.

MIDDLE: Carbide tipped finishing section of a Continental broach used on a cast iron application.

BOTTOM: Rough cast-iron parts made it necessary to use this carbide tipped broach to obtain satisfactory tool life in cutting half-round slots.



Solid carbide shell used on the finishing end of a High-Speed steel broach to hold size in cast iron parts.

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Continental TOOL WORKS

DIVISION OF EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 6 February 8, 1954

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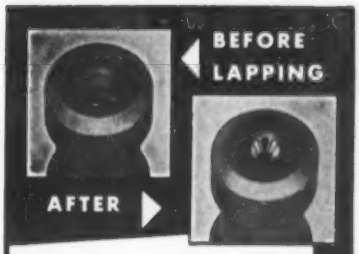
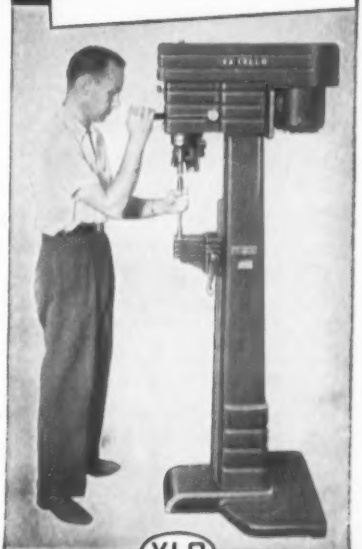


PROBLEM:
To get accurate positioning from female centers.

ANSWER:
LAP THE CENTERS

Ex-Cell-O Center Lapping Machines correct inaccuracies of rough centers, assuring GREATER PRECISION from your present equipment. They are easy to operate. Center Lapping reduces manufacturing costs by minimizing waste from grinding rejection; shortens assembly time because of closer tolerances. All the facts are in Bulletin No. 40271. Write for a copy.



53-28 XLO

CENTER LAPPING MACHINES
BY
EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

(Advertisement)

what's NEW in Engineering

A triple threat fire truck to fight oil field fires is reported to have been perfected by the Seagrave Corporation of Columbus. Unlike ordinary fire-fighting apparatus, the new truck is designed to snuff out oil field and refinery fires any one of three ways; by squirting out 2800 gallons of water a minute, 1300 pounds of dry chemical compounds, or 19,000 gallons of fire-smothering "foam". In an emergency, all controls on the 20 600 pound unit can be operated by one man.

To utilize low grade ores previously stockpiled, Kaiser Engineers has designed and built a new beneficiation plant at Eagle Mountain Mine, California. The new plant will increase the iron content of the ore shipped and thus further reduce the operating costs of the West's only completely integrated steel plant, 163 miles away. Incidentally, 51 miles of this distance is over the standard gauge railroad designed by Kaiser Engineers to cross the Southern California desert and connect the mine with the tracks of the Southern Pacific.

Temperature Measurement in Engineering, described as a "how to" book for the proper design, performance, and operation of temperature measurement installation, has just been published by Wiley. The authors of the new book are H. Dean Baker, E. A. Ryder and N. H. Baker.

Kaiser Engineers has a large staff of engineering and construction experts ready to tackle your problems in all fields of design, engineering and construction. Call or write: Kaiser Engineers Division of Henry J. Kaiser Company, Kaiser Building, Oakland 12, California.

behind the scenes

Too Many Decibels

We'd like to put in our bid right now for the ear plug concession in American metalworking plants. Why? Because noise is giving industry one great big headache. One eastern company, for example, had to pay a whopping doctor's bill of $5 million for "boilermaker's ear" last year.

Sound experts say that prolonged noise from 100 to 120 decibels will cause some hearing loss for most workers and that the average noise in factories today is 85 decibels.

What to do about it? Harry Chandler, STEEL associate editor, is delving into the problem right now. Look for his article "You *Can* Do Something About Plant Noise" coming up in the Mar. 1 issue.

Follow the Leader

Did you read in STEEL two weeks ago about how Kearney & Trecker Corp. of Milwaukee took one large giant step forward in the race for 1954 machine tool sales by announcing its new tool lease program?

The plan, as you remember, offers the entire K & T line of standard machine tools under a rental agreement.

We don't pretend to know whether or not the K & T move is the forerunner of a mass machine tool manufacturers' movement in the direction of tool lease programs. We know that Warner & Swasey has its hat in the ring and that DoAll Co. has been doing it successfully for years.

We know, also, that IBM and Remington-Rand have been employing equipment leasing programs for years and years.

Manufacturers of capital equipment take notice. Could be we're watching the start of the biggest game of follow-the-leader since Adam met Eve.

Genius Will Out

Those of you who are called upon to interpret data in your day-to-day work will enjoy this letter from Walter Toerge, account executive at Ketchum, MacLeod & Grove Inc. The parenthetical comments are ours.

"If you want to talk about reader acceptance, *(and what advertiser doesn't?)* within 48 hours after STEEL had hit the desk *(of its readers, of course)*, your article *(Mackintosh-Hemphill roll story—Jan. 18 issue)* had produced no less than six requests for the book *(only six?)*

"It all goes to prove *(this is still Toerge speakin')* that (1) people read STEEL *(naturally)*; (2) people read "Progress in Steelmaking" *(it follows)*; (3) they leaf through the book concentrating on 5½-pt. footnotes *(this is printers' jargon for a specific type size and has no reference to liquor decanters whatsoever)*; (4) they read first columns all the way down and through the footnotes *(seems logical)*; (5) they want to know how to make rolls *(we like English muffins best)*; (6) they have an insatiable curiosity about what their competitors are doing *(just got over a cold ourselves—maybe penicillin will help)*; (7) they aren't very busy anyway *(how did that one get in there?)*; (8) things are getting tough *(he's telling us!)*"

Have you ever seen so many deductions made so quickly from so little evidence—*and every one of them true?* This fellow is a genius. We predict he will go far.

Is This a Trend?

Over our coffee and crullers this morning we noted that the directors of Nash-Kelvinator Corp. and Hudson Motor Car Co. are currently considering details of a proposed merger.

Could this be the tip-off that the independent auto manufacturer is finding the going a little rough? Is it a case of "united we stand; divided we fall?"

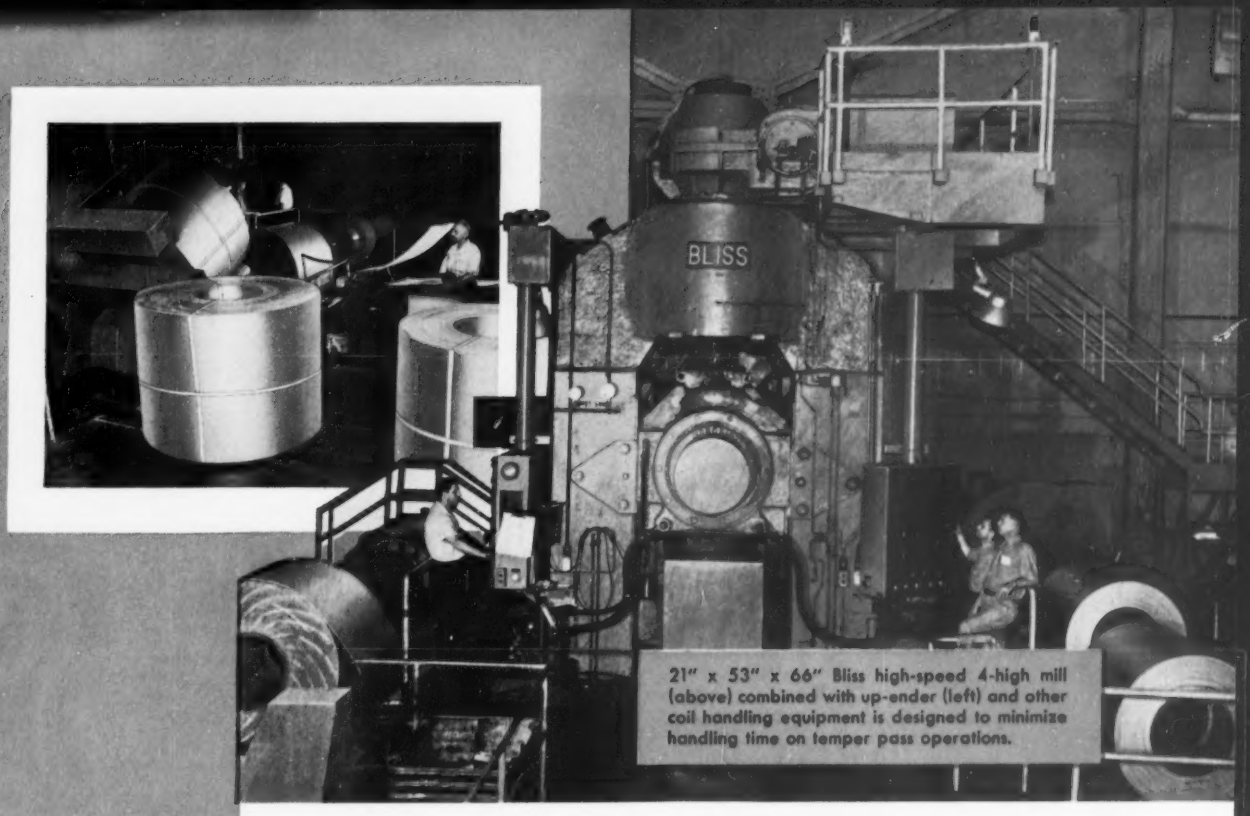
The Big Three are making muscles like they plan to bear hug an even greater chunk of the new car market.

Automaker production plans call for churning out 5 million cars in '54 . . . car dealers think this is a million too many.

This might well be the year for us to make a deal on the family gas burner. What with power steering, power brakes, more powerful engines, how can a weak little character like us resist . . . particularly when the dealer will probably throw in a free refrigerator, trip to Bermuda and a picture of Marilyn Monroe (pre-Joe DeMaggio) to boot. Also, that is.

Shrdlu

(Metalworking Outlook—Page 59)



21" x 53" x 66" Bliss high-speed 4-high mill (above) combined with up-ender (left) and other coil handling equipment is designed to minimize handling time on temper pass operations.

BLISS mill at the Ford steel plant designed to give OPTIMUM MILL USE

Looking for ways to cut down on idle rolling mill time? Most metal producers are. Then consider the recent Bliss installations at Ford Motor Company's great Rouge plant where the new Bliss 4-High Temper mill was designed to do just that.

Bliss engineers approached the problem by combining the most advanced coil handling equipment and electric controls with a new high-speed mill. The entire installation was engineered to Ford's rigid requirements for providing optimum mill use on temper pass rolling. Here's how Bliss designed to meet these specifications:

Speedier coil handling—entry conveyors, up-ender, coil positioning and preparation cradle, and reels operate faster; give unprecedented protection to coil edges and operating personnel.

Heavier coils used—weighing up to 56,000 lbs. each, in maximum 60" widths, and maximum 72" O.D.; larger coils mean less frequent "threading".

Continuous Strip inspection—facilitated by special electric devices and engineered vantage points of inspection.

Roll changeover is quick and easy—with motorized equipment.

Screwdown settings and adjustments—made more quickly due to highly powered electric equipment with fine control.

If you have a mill equipment problem, do as other leading mill users do. Consult BLISS. Meanwhile, write for your copy of our revised 60-page brochure. Bulletin 40-A.

Remember: BLISS **for Presses, ROLLING MILLS, Special Machinery**

E. W. Bliss Company • General Office: Canton, Ohio

ROLLING MILL DIVISION: SALEM, OHIO

Subsidiary: The Die Supply Company, Cleveland, O. • E. W. Bliss (England) Ltd. • E. W. Bliss Company (Paris) France

U. S. Plants in Canton, Salem and Toledo, Ohio; and Hastings, Michigan. *Branch Offices* in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. *West Coast Representatives:* Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Company, Seattle. *Other representatives throughout the world.*

GIDDINGS & LEW
HYPRO

Photo courtesy of
TEMCO Aircraft Corporation
Dallas, Texas

Metal Surgeon...

with a flair for general practice

Performing with speed and precision this G & L Openside Planer gives you a highly versatile tool to handle both common and uncommon work with equal efficiency

Productive flexibility . . . that's one of the many big advantages of using a G&L Planer such as this Hypro Openside machine. Whether it's a simple or complex job . . . long or short run . . . big or small workpiece — this versatile machine completes it in minimum time with a minimum of setups.

Its openside construction allows you to handle workpieces up to 120 inches in width. Table lengths can be furnished in the proper size you need, and horsepowers range up to 100. Smooth, responsive control minimizes tool breakage, and outstanding rigidity allows holding tolerances within ten-thousandths.

For complete information on the G&L line of Openside or Double Housing Planers, see your representative or write —

GIDDINGS & LEWIS MACHINE TOOL CO.

FOND DU LAC, WISCONSIN

Builders of the world's finest heavy-duty machine tools—Horizontal Boring, Drilling and Milling Machines — table, floor and planer types; Hypro Double Housing and Openside Planers; Planer Type Milling Machines and Vertical Boring Mills; and Davis Cutting Tools

STURDY

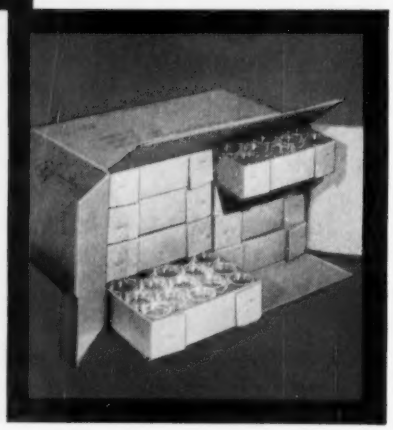
CONSTRUCTION

ECONOMICAL

SHIPPING

POSITIVE

PROTECTION



Write for free booklet, "How To Stack & Load Corrugated Shipping Boxes." Hinde & Dauch, Sandusky 47, Ohio.

HINDE & DAUCH

Authority on Packaging

LETTERS
TO THE EDITORS

Titanium Analyses

One of the divisions of this association is known as the Metal Dealers Division. Our members in this division deal in all types of nonferrous scrap metals.

The matter of titanium, with the resulting generation of scrap through its use in industry, is coming more and more to the forefront.

While attending the annual convention of the Institute of Scrap Iron & Steel Inc. in Washington, I was informed that in a recent issue you carried an article on titanium, including analyses of it as produced by the present firms in the field.

I should like very much to obtain a copy of that article.

Clinton M. White
National Association of
Waste Material Dealers Inc.
New York

• *The table of producers of titanium and composition of the alloys offered was contained in our Metal Show issue (Oct. 12, p. 170) in the "Light Metals . . . Metallic Materials" section. We're sending a reprint of this section.—ED.*

ABCs of Government Specs

In the Jan. 18 issue there appeared the article "Know Your A,B,Cs of Government Specifications" (p. 100) by Dr. Allen G. Gray. We very much appreciated reading this clear-cut discussion of specifications and would like four tear sheets.

M. L. Cowan
purchasing agent
Librascope Inc.
Glendale, Calif.

Please send a tear sheet of "Know Your A,B,Cs of Government Specifications" . . .

E. O. Denton
Wyandotte Chemicals Corp.
Wyandotte, Mich.

We'd appraciate two tear sheets of "Know Your A,B,Cs . . ."

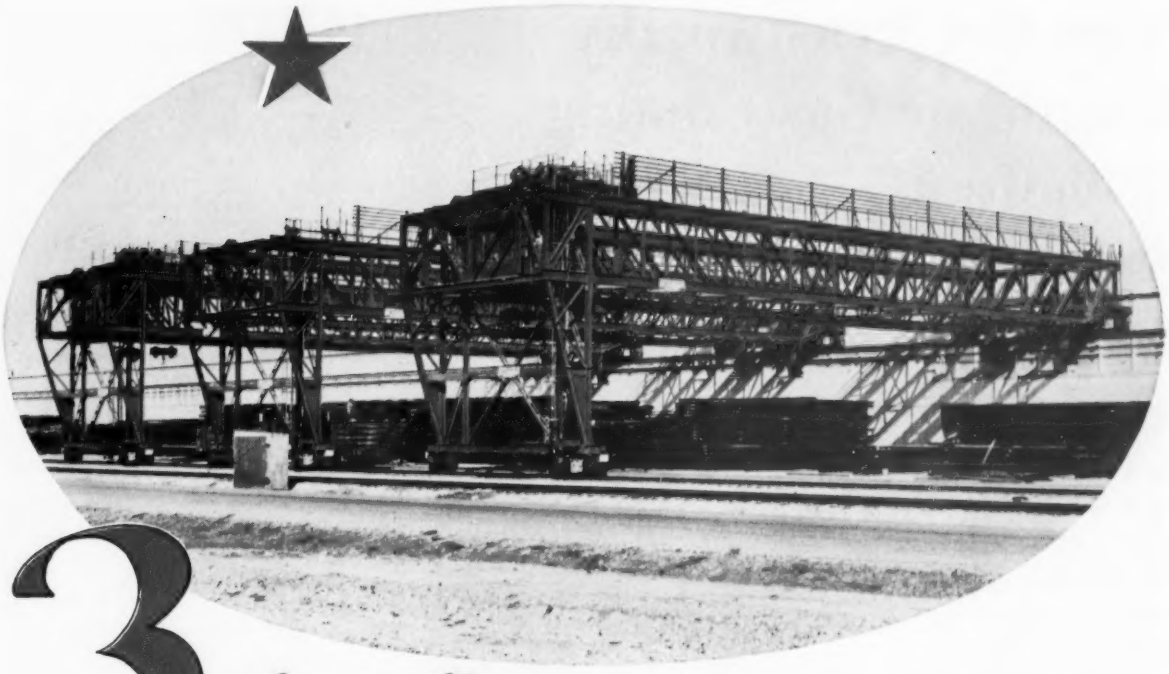
G. H. Pope
supervisor
Test Maintenance & Operations
Propulsion Wind Tunnel
Aro Inc.
Tullahoma, Tenn.

Machine Tools Surveyed

In the Nov. 16 issue, Part II, "Machine Tool Buyers' Guide", you reported a survey of various machine tool features including hardened ways. Since Ohio Knife Co. is a producer of hardened and ground ways, this survey is of great interest to us. If you could advise us just how your readers referred to this item and some of the reasons for the preference, it would be of great help.

We would also greatly appreciate your

Please turn to p. 12



3 Heyl+Patterson Gantry Cranes

"KEEP THE PIPE MOVING" at the New Pipe Mill of LONE STAR STEEL COMPANY

Newly-formed steel pipe comes off the production line at a rapid rate at the Lone Star Steel Company's new pipe mill, Lone Star, Texas.

As the finished pipe moves to the storage yard, one of three Heyl & Patterson Traveling Gantry Cranes unloads the pipe from the transfer car and carries it directly to railroad car or truck for shipment or to a spot in the yard for storage.

All three 15-ton H & P cranes, each equipped with a man-trolley, move over the entire span of the storage yard, unloading and transferring pipe without delay.

These three gantry cranes, as well as a 40-ton overhead crane operating inside the slabbing mill, were designed and fabricated by Heyl & Patterson and erected under the guidance of a Heyl & Patterson erection superintendent.

When your problem concerns transferring, loading or unloading pipe, ore, coal, slag or any heavy bulk material . . . remember Heyl & Patterson's ability to do the WHOLE job—All the Way from Design to Erection. Since 1887 Heyl & Patterson has designed, fabricated and erected all types of Heavy Bulk Materials Handling Equipment for the world's major industries.

- Ore Bridges
- Railroad Car Dumpers
- High Lift-Turnover-Rotary
- Coal Preparation Plants
- Coal & Coke Handling Equipment
- Boat Loaders and Unloaders
- Rotary Mine Car Dumpers
- Coal Crushers
- Coal Storage Bridges
- Car Hauls and Boat Movers
- Bradford Breakers
- Refuse Disposal Cars
- Thorsten Coal Sampling Systems
- Kinney Car Unloaders
- Pig Iron Casting Machines
- Cyclone Thickeners
- Thermal Dryers
- The Drying Dutchman
- Reineveld Centrifugal Dryer

Heyl+Patterson, Inc.

"SINCE 1887"

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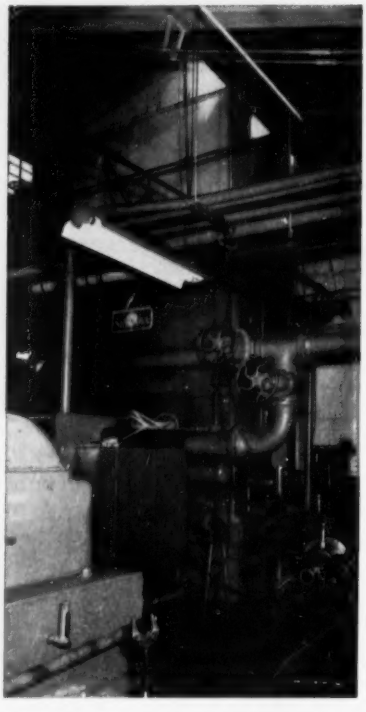
You are assured of uniform, constant production and quality from any process . . . steady, reliable operation . . . lower cost for more dependable cooling. You can have closed system cooling with freedom from scale, dirt, corrosion and maintenance troubles. You can accurately cool more than one type of liquid with one machine.

The Niagara Aero Heat Exchanger uses atmospheric air to cool liquids and gases by evaporative cooling. You can remove heat at the rate of input to keep accurate control of gas or liquid temperature. You can put heat back into the system to save the losses of a "warm-up" period or to equalize the effect of load variations.



Great savings in cooling water and savings in piping, pumping and power return the cost to you quickly. The Niagara Aero Heat Exchanger can save you approximately 95% of your cooling water cost. Write for Bulletin 120.

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced District Engineers in all Principal Cities of U.S. and Canada

LETTERS

Concluded from p. 10

permission to reproduce the information with regards to machine ways shown in the article.

O. C. Underhill
Ohio Knife Co.
Cincinnati

● *Special questions were sent to our readers giving them a choice of answers to the questions we presented to them. The hardened and ground classification was checked by 57.1 per cent, hardened steel insert was checked by 38.6 per cent and so on down the line. Comments were not requested. You have our permission to reprint the information on machine ways.—ED.*

Sees Fairless Story in India

A very interesting article on the new Fairless Works of the U. S. Steel Corp. appeared in the Sept. 22, 1952 issue of STEEL. I am unable to lay my hands on this article now and I would be grateful if you will kindly send me a copy of it.

A. H. Sethna
Tata Iron & Steel Co. Ltd.
Calcutta, India

Who and Where Department

An article in the Dec. 28 issue (p. 60) mentions that Stanley Aviation Corp., Buffalo, N. Y., will construct a $500,000 plant near Denver, Colo. May I have the complete address of the Stanley Aviation Corp.?

Marshall W. Dittmar
Bendix Aviation Corp.
Mishawaka, Ind.

● *It's Stanley Aviation Corp., Municipal Airport, Williamsville, Buffalo, N. Y.—ED.*

In your Jan. 11 issue you mention that there are 3300 private research organizations in the U. S. in the article "'53 Research Hits All-Time High" (p. 30). Do you have a list of these organizations? If not, would you please give the name of the source where I could get same.

David M. Warren Jr.
109 Frelinghuysen Ave.
Newark, N. J.

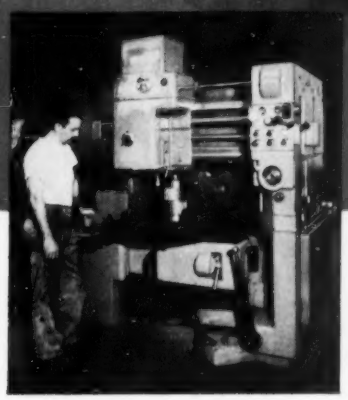
● *Sorry, we don't have a list of all private research organizations in the U. S. Among the helpful information sources on the subject of research organizations is the National Research Council, 2101 Constitution Ave., Washington 25.—ED.*

I noted with interest your article "New Uses Reinforce Slag Markets" (Dec. 14, p. 83). I would appreciate your giving me the full address of the National Slag Association. Also, could you tell me whether this is a private concern or is an association of individual or corporate members?

R. David Thomas Jr.
Arcos Corp.
Philadelphia

● *The address is National Slag Association, Warner Bldg., Washington 4. This is a national organization of manufacturers.—ED.*

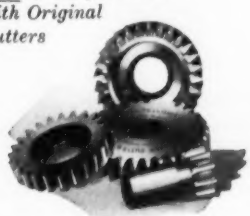
Production-Run Specialist... with Job-Shop FLEXIBILITY



For gear-cutting jobs, on production runs or in small lots, this ultra-modern heavy-duty Fellows "36" is a fundamental machine for any Gear Shop. It provides a combination of advantages never before available. You can cut spur or helical gears—from broad-face pinions up to gears of 36" p.d.—external or *internal*. And you can cut herringbone gears, cams, ratchet teeth, splines, special contours, etc.

With an assortment of standard cutters you are ready to turn out multiple production runs, fast—or shift from one item to another "with the greatest of ease." Ask your Fellows Representative to give you some revealing facts on the production record of the 36-Type Gear Shaper, or write the nearest Fellows Office.

For Absolute Quality Control
Tool up with Original
Fellows Cutters



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America's preferred strip steel

We can supply any strip steel you need, in any quantity you need, and we get it to you *when* you need it. That's why U·S·S Amerstrip is more widely used in a greater variety of products than any other strip steel.

Amerstrip comes in a complete range of analyses and tempers in carbon, stainless, and alloy steels . . . in coils or cut lengths . . . with a round or square, natural or rolled edge . . . and in all commercial finishes.

If you have any question about the selection or use of strip steel, write to American Steel & Wire, Room 842, Rockefeller Building, Cleveland 13, Ohio.

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

4-30

UNITED STATES STEEL

Vapor-from-paper STOPS RUST

Saves greasing, saves degreasing

Short term storage of these "in-process" parts used to be a problem.

Humidity caused rust, even while parts were in temporary storage. Now, tote pans are simply lined with Angier VPI* Wrap. *The highly polished metal surfaces* stay *rust-free.* And there's no slushing or "cleaning" to do.

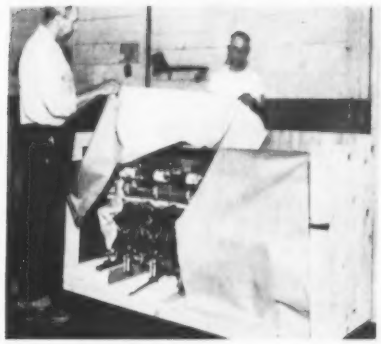
This fast, clean way to prevent rust has *proven* effective throughout metalworking—and for the military. *How VPI works* and *where it can cut your costs* are told in "VPI Facts".

*®Vapor rust preventive. Angier VPI Wrap (2 gram) is made to conform to the government's specification on volatile rust inhibitors—MIL P 3420.

Does *your* management know about VPI?

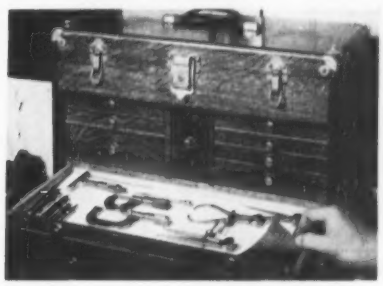
Protective papers for industrial, building and farm needs since 1895. Distributors in Principal Cities.

Angier



9 hour packaging job cut to 1½. That's what Angier VPI Wrap did for the exporter of this textile machine.

A new sales advantage was discovered by this VPI user. Customers say they like the way armatures stay bright.



Free sample *for your tool box...*

Angier Corporation, Framingham 8, Mass.
Send sample & *VPI FACTS* as applied to

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- ☐ Steel in process of fabrication.
- ☐ Electrical Machinery, Appliances, Products.
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- ☐ Ordnance Equipment.
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- ☐ Others:

Name, Title (Sign and clip to letterhead)

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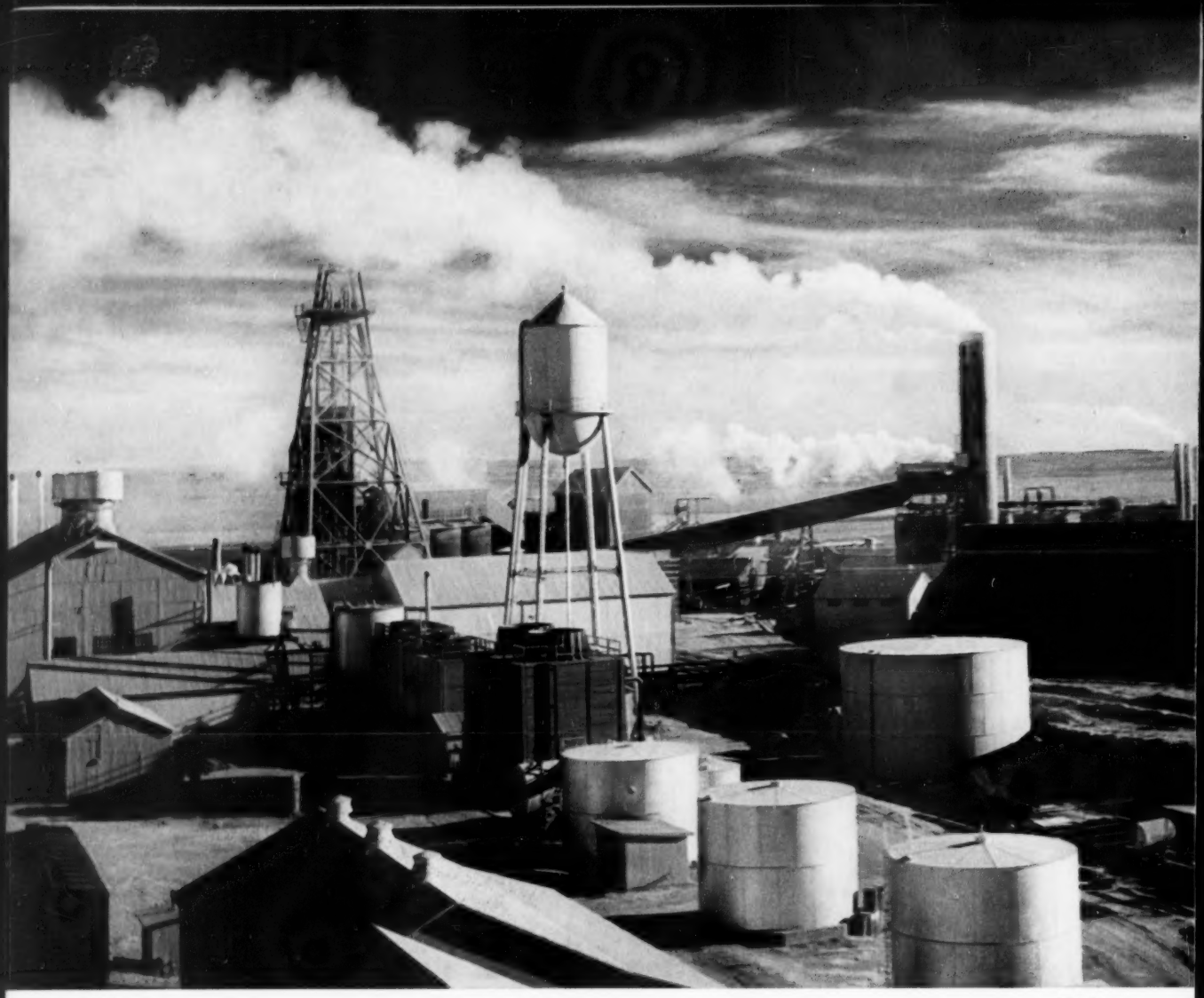

Potash Mining

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The Invisible Background of Industrial Progress

Potash is a well-known ingredient contained in most commercial chemical fertilizers in use today. Modern agricultural methods prescribe that, to insure farmers a good yield of higher quality produce, it is necessary to replace the loss of basic natural chemicals by means of fertilization. Potash is especially important and necessary in those areas where cotton, tobacco, corn and potatoes are the main crop.

Modern equipment, needed to mine, handle and transport such materials to the consumer at an equitable price, are basically a product of *Modern Machine Tools* — those tools essential in "The Invisible Background of Industrial Progress."

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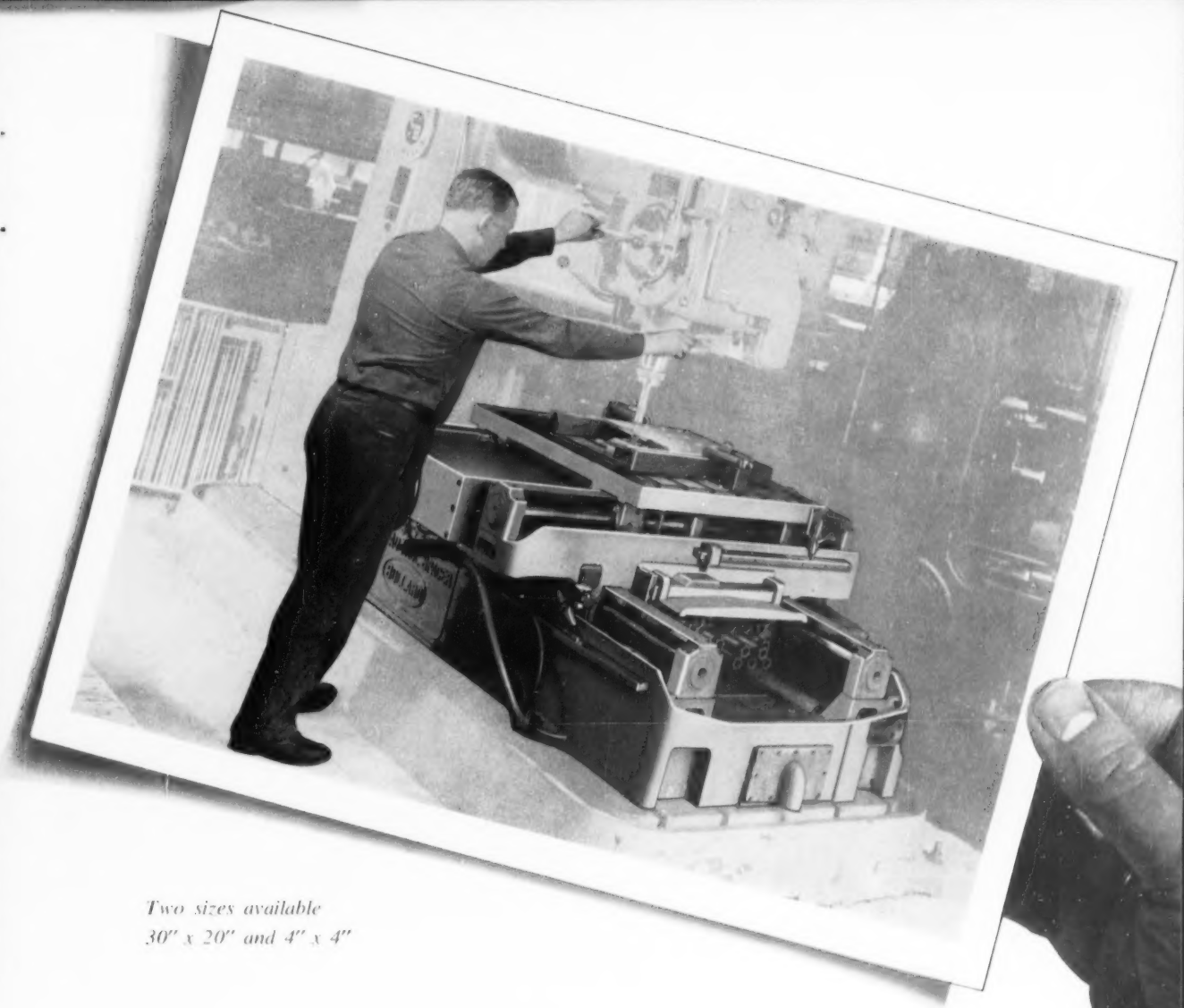

Two sizes available
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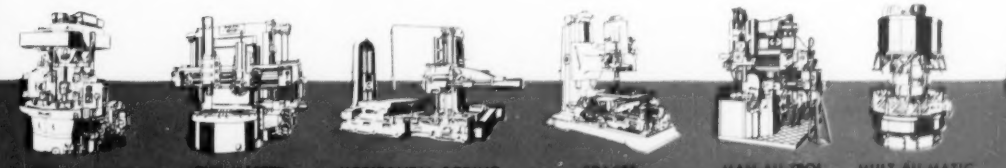
Space your costs by spacing without jigs — eliminate the cost of jig design, maintenance, storage and handling — use a Bullard Spacing Table under a fixed spindle of a Radial Drill or a Cincinnati Bickford Super Service Drill.

The advantages of accurately positioning work under a fixed spindle for any combination of drilling, boring, reaming or tapping operations are: (1) Greater speed and accuracy than is obtainable with jigs. (2) Elimination of the long period required to design and make jigs. (3) Elimination of jig bushings which are subject to continuous wear and generally require repeated replacement. (4) Accuracy is inherently maintained. (5) Simplicity of operation of the Spacer permits the use of semiskilled operators on precision work. (6) Freedom from operator fatigue, since positive locating of the work is done automatically. (7) Extreme flexibility, permitting the use of the Spacer for a large variety of both large and small work. (8) Complete visibility of the work at all times, greatly facilitates inspection.

Ask a Bullard representative to explain the many cost-saving advantages which this Spacer will afford when applied to your work or write to The Bullard Company, 286 Canfield Avenue, Bridgeport 2, Connecticut or phone 6-2511.



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NEW!

SPOT WELD without jigs or back-up plates

Now you can spot weld with complete maneuverability — and as fast as you can pull the trigger — with the new portable AIRCOSPOT® Gun.

With **AIRCOSPOT,** Air Reduction's new inert-gas-shielded spot welding unit, you simply touch the water-cooled gun to one side of the work and pull the trigger. In about a second you have a spot weld. It will be a good one, too, because **AIRCOSPOT'S** inert gas shield completely protects the hot metal from contamination by the air.

Write today for prices and folder that provides detailed information.

AIRCOSPOT welds all sheet steels — including stainless up to 3/16" — to bottom sections of varying thickness.

AIRCOSPOT is fast. Once the controls are set, you can make thirty or more welds a minute.

AIRCOSPOT is easy to use. Operators need no special training. The welding cycle is fully automatic.

AIRCOSPOT is handy. Gun weighs four pounds, is nine inches long. All connections—current, gas and water—are through a single control panel.

AIRCOSPOT is rugged. No abuse-sensitive high frequency or electronic circuits, because Gun is of electromechanical design.

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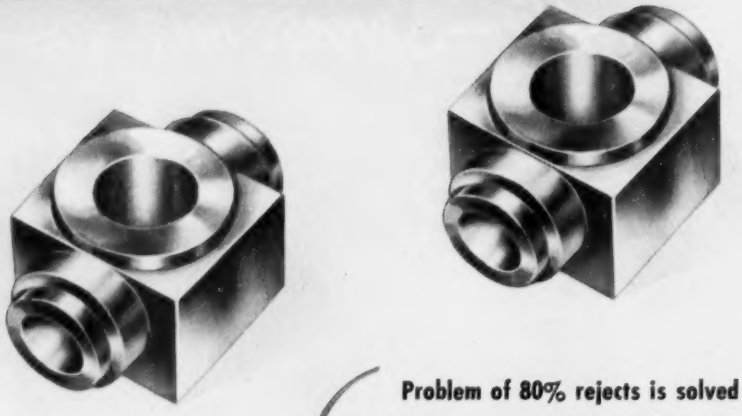
2 Stainless Parts...look alike



but with 1 of them

Problem of 80% rejects is solved

This is a precision part for a military bombsight. Some of the tolerances are ±.0001". Dependability is a "must". Every factor has to be "on the nose". Yet when the subcontractor used several ordinary Type 416 Stainless steels, rejects ran as high as 80%. But then he made one change... to Carpenter No. 5 (Type 416)... and eliminated the problem.

Tool life increases

Also, tool life was short, machine downtime excessive, and production was lagging. Then one change was made—to Carpenter Stainless No. 5—and machining time was shortened, tool life raised to a trouble-free level.

Production jumps

With Carpenter No. 5 production of this part is up to schedule because the reject problem has disappeared, machining time stepped up and tool life increased. Here is just one more example of how *Carpenter quality* makes a real difference in stainless fabrication. The next time you order stainless, be sure it's Carpenter. Watch it speed production—ease headaches from first operation to the last.

Make the <u>one</u> change that counts...

change to *Carpenter* STEEL — **Free-Machining Stainless**

take the problems out of production

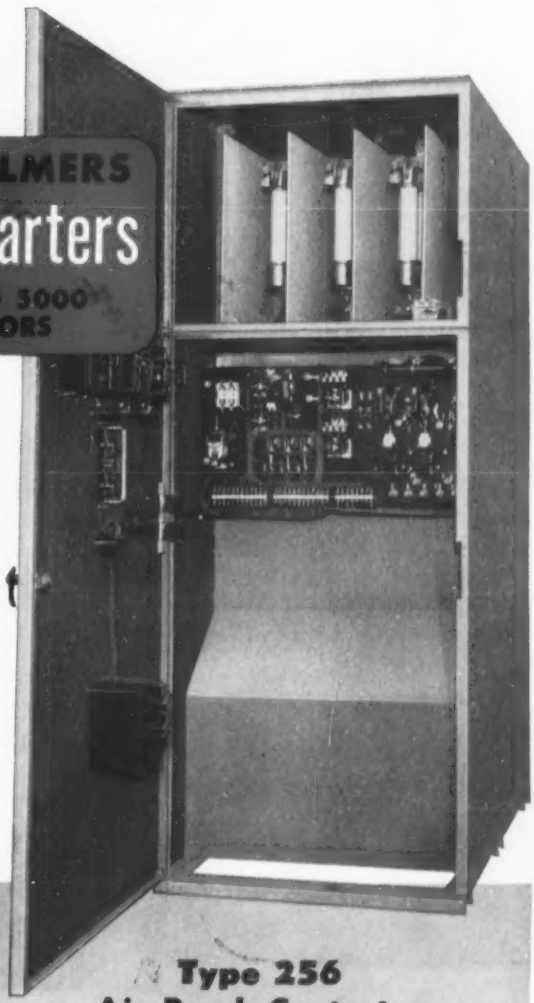
THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.
Export Department: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

For fast delivery, call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor

When the Going's *Rough!*

Designed and Built for Steel Industry Application

ALLIS-CHALMERS
Type H Starters
FOR 2300 TO 5000 VOLT MOTORS

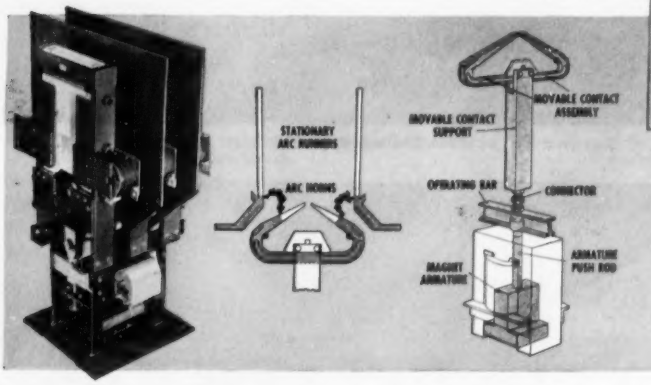


HERE IS A STARTER that is as rugged as the steel industry itself. All the starter's components . . . contactors, meters, overload relays, current limiting fuses, auxiliary switches . . . are engineered and coordinated to meet heavy duty steel mill demands — to provide high capacity interruption and complete protection for man, motor and machine.

Exemplifying the ruggedness of the Type H starter is the 256 air-break contactor. Frequent starting, inching, reversing or dynamic braking are taken in stride by this dependable performer. Contactor operations can be numbered in the millions with only routine servicing.

In many steel mill applications demanding high repetitive duty, the Type H starter can be used in place of circuit breakers . . . affording substantial savings in initial cost *and* upkeep. Find out how the Type H starter fits into your control picture. Call your nearby A-C representative or write Allis-Chalmers, Milwaukee 1, Wis. Ask for bulletins 14B6410B and 14B7303.

A-4102

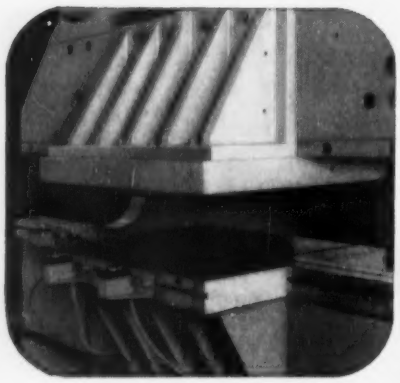


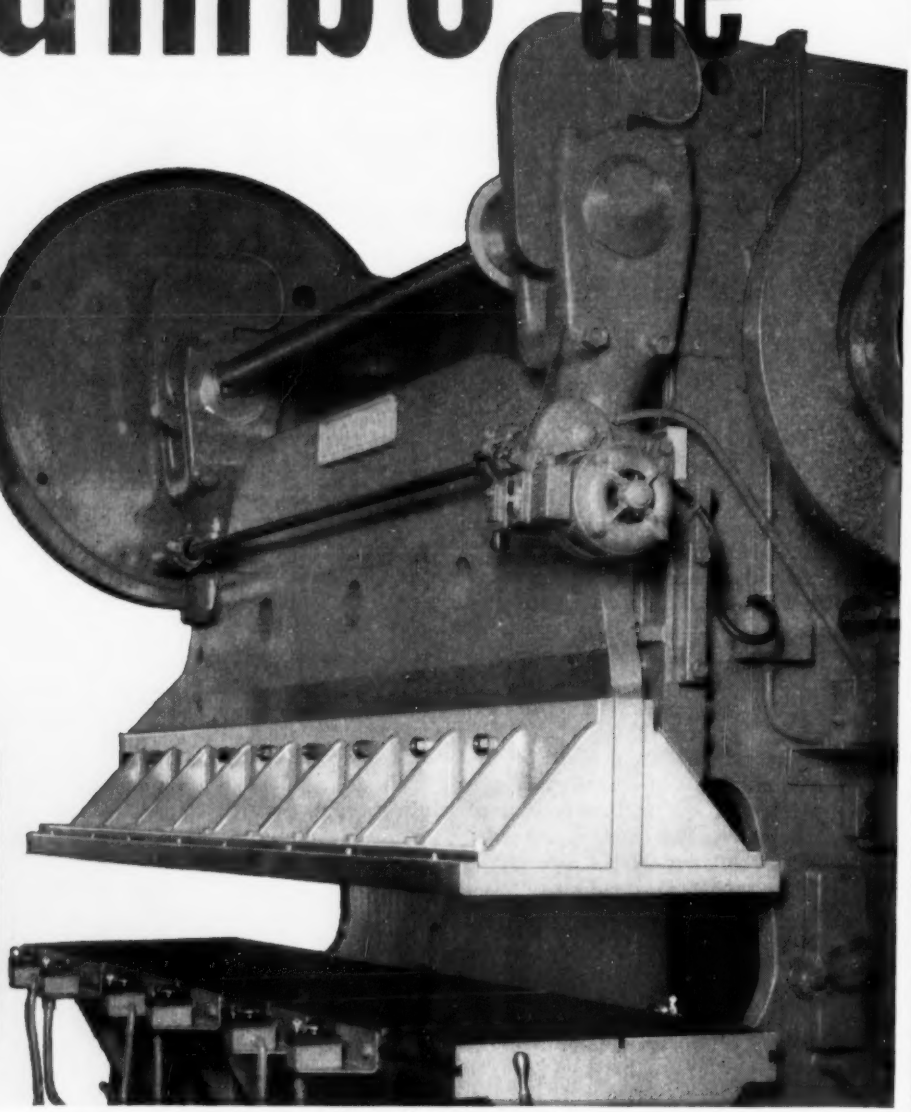
Type 256 Air-Break Contactor

Double-break contacts, vertical action and dual blowouts provide long, trouble-free life. No turning shafts, shaft bearings or flexible leads to cause maintenance headaches.

ALLIS-CHALMERS

Jumbo die





• Short, special purpose, removable upper brackets.

• Large area, removable upper brackets.

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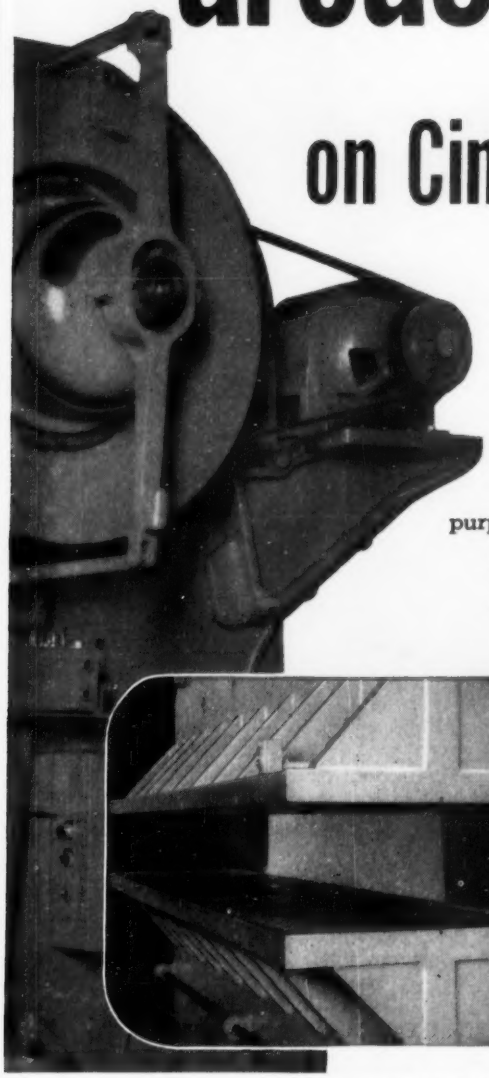
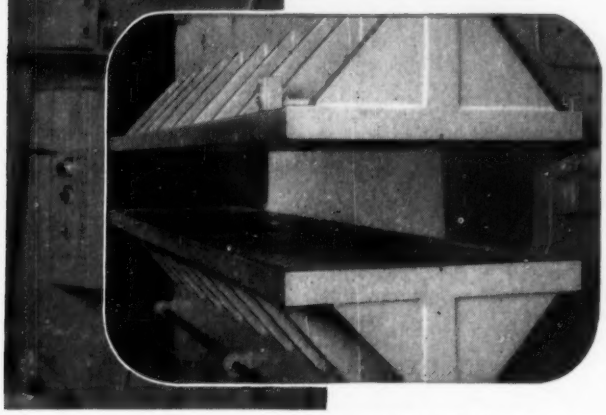
areas...

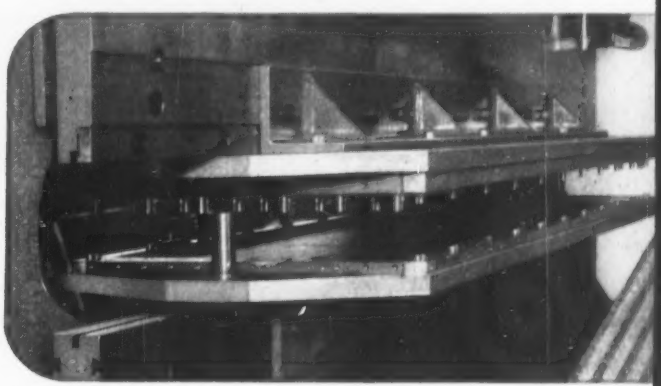
on Cincinnati Press Brakes



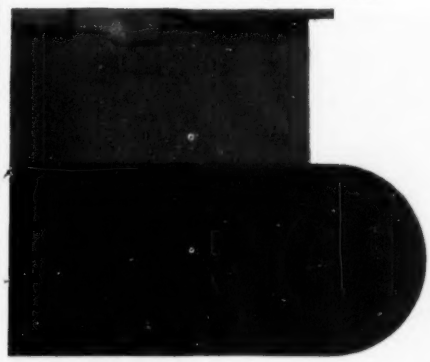
More and more jobs are being done on versatile Cincinnati Press Brakes. Removable or fixed brackets with large die areas permit many jobs to be done both in the Press Brake and Press fields. When dual purpose performance is required removable brackets are used—for Press work only, fixed brackets are furnished. Brackets are designed to sizes desired.



• Large area, permanent wide bed and ram for press work.



• Large area, removable upper and lower brackets.



Investigate! Our Engineering Department will be glad to advise you on the profit and production possibilities in your shop. Write for Catalog B-4.

Costs less to use!

As THE industry's *highest* quality maintenance material, Permanente 84 keeps steel furnace bottoms in good operating condition with *less material* than usually required.

Thus, it actually *costs less* to use Permanente 84 than materials with a lower initial cost.

Leading steel producers report that Permanente 84, by lasting longer, helps cut down-time for maintenance and repair as much as 50%!

This means Permanente 84 makes possible more steel at lower cost per ton.

Order Permanente 84 now, and get that extra tonnage! It's your *best buy* for bottom, bank and tap hole maintenance. Also ideal for open hearth and electric furnace rebuilds.

For complete information contact principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., Oakland 12, California; First National Tower, Akron 8, Ohio.

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Bricks and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

CALENDAR
OF MEETINGS

February 11-12, Western Computer Conference & Exhibit: Ambassador hotel, Los Angeles. Information: H. G. Weightman, 1405 W. Magnolia Blvd., Burbank, Calif.

February 13-18, Automotive Electric Association: Annual meeting, Edgewater Beach hotel, Chicago. Association address: 802 Michigan Bldg., Detroit. Executive secretary: S. W. Potter.

February 15, American Society of Civil Engineers: Winter meeting, Hotel Biltmore, Atlanta. Society address: 33 W. 39th St., New York. Executive secretary: Col. William N. Carey.

February 15-17, American Management Association: Personnel conference, Palmer House, Chicago. Association address: 330 W. 42nd St., New York. Vice president-secretary: James O. Rice.

February 15-17, Association of Iron & Steel Engineers: West coast meeting, Hotel Statler, Los Angeles. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. J. Ess.

February 15-17, National Welding Supply Association: Annual meeting, Fairmount hotel, San Francisco. Association address: 1900 Arch St., Philadelphia 3. Secretary: Robert C. Fernley.

February 15-18, American Institute of Mining & Metallurgical Engineers: Annual meeting, Hotels Statler and McAlpin, New York. Institute address: 29 W. 39th St., New York. Secretary: E. H. Robie.

February 19-20, Machinery & Allied Products Institute: Third session, seventh conference on capital goods economics, Statler hotel, Washington. Information: Secretary, Charles W. Stewart, 1200 18th St. NW, Washington 6.

February 22-25, Annual Industrial Ventilation Conference: Kellogg Center, Michigan State College, East Lansing, Mich. Information: Continuing Education Service, Michigan State College, East Lansing, Mich.

March 3, Steel Kitchen Cabinet Manufacturers Association: Spring meeting, New York. Association address: Engineers Bldg., Cleveland 14. Executive secretary: Arthur J. Tuscany Jr.

March 3-4, American Machine Tool Distributors Association: Spring meeting, Boca Raton hotel and club, Boca Raton, Fla. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

March 4-5, American Society for Metals: Midwinter meeting, Hotel Statler, Boston. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

March 8-12, National Electrical Manufacturers Association: Mid-winter meeting, Edgewater Beach hotel, Chicago. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

March 9-12, American Management Association: General management conference, Fairmont hotel, San Francisco. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

March 10-12, Society of the Plastics Industry Inc.: Pacific coast section conference, Hotel Del Coronado, Coronado, Calif. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

March 10-12, American Society of Mechanical Engineers: International meeting, Mexico City, D. F. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

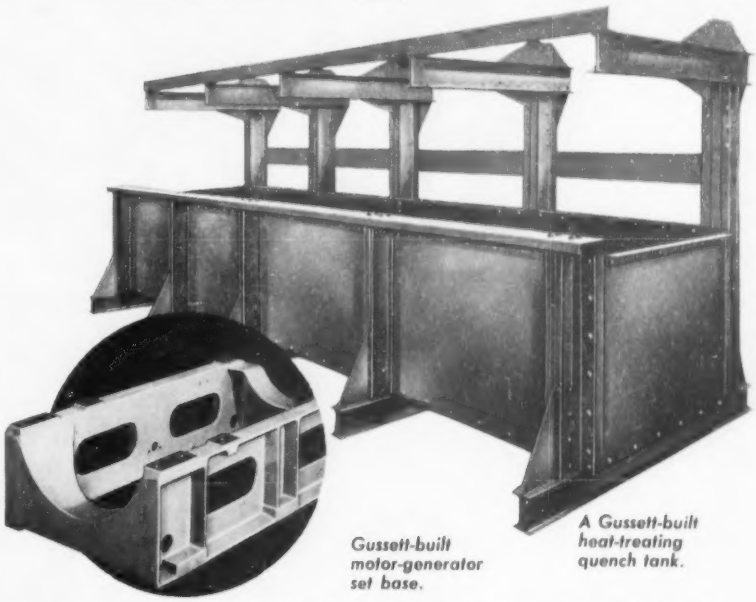
March 15-17, National Association of Waste Material Dealers Inc.: Annual meeting, Hotel Waldorf-Astoria, New York. Association address: 271 Madison Ave., New York 16. Managing director: Clinton M. White.

March 15-19, National Association of Corrosion Engineers: Annual conference and exhibit, Municipal Auditorium, Kansas City, Mo. Association address: 1061 M & M Bldg., Houston 2. Executive secretary: A. B. Campbell.

March 17-19, Pressed Metal Institute: Spring technical meeting, Hotel Carter, Cleveland. Institute address: 2860 E. 130th St., Cleveland. Managing director: O. B. Werntz.

GUSSETT

TAKES THE HEADACHES OUT OF BUYING WELDMENTS



Gussett-built motor-generator set base.

A Gussett-built heat-treating quench tank.

You save time and trouble (and, frequently, more than a little of the cost) when you have Gussett make your weldments.

Gussett engineers are able to prepare working drawings for most efficient fabrication from your design prints, descriptions or service requirement data, relieving you of this responsibility and insuring economical production and good delivery schedules.

Gussett's complete, modern plant has every facility for handling the work efficiently and speedily . . . whether a single piece or many duplicate units . . . yet it is small enough to permit every job to be accorded the personal interest vital to successful custom fabrication.

. . . And Gussett brings to bear on every job the experience and "know-how" of 40 years of pioneering in steel and alloy plate fabrication.

Include Gussett in your next "Request for Quotation" mailing. If it requires personal contact, a wire or phone call (Canton 7-3413) will bring a representative qualified to give every possible assistance.

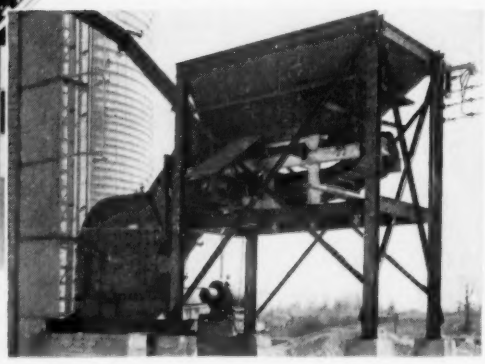
THIS FILE BULLETIN WILL HELP YOU to plan your fabricating jobs. It contains a complete listing of Gussett facilities and capabilities. Write for a copy.

GUSSETT
BOILER & WELDING, INC.
CANTON 10, OHIO

PLAIN OR LINED TANKS • PRESSURE VESSELS • HOPPERS • VULCANIZERS
GENERAL STEEL AND ALLOY PLATE FABRICATION • BINS • STACKS
LARGE DIAMETER PIPE • WELDMENTS • MACHINE BASES AND FRAMES

a hard-hitting giant

A Rock Buster installation. Apron Feeder under hopper and Bucket Elevator are also part of the Jeffrey equipment in this plant.



JEFFREY PRIMARY IMPACT-TYPE

ROCK BUSTER

Today's smash hit in stone, cement, carbon, calcium carbide, steel and related industries, is this powerful Jeffrey Crusher. Manganese hammers reduce hard, friable, non-abrasive materials to a cubicle product of market size. Simple, efficient *one-rotor* construction gives greatest possible reduction *in one pass.* In many cases one Rock Buster replaces both primary and secondary crushers of conventional design.

TOP PERFORMANCE — LOWER UPKEEP EASIER MAINTENANCE

Rock Buster users report big advantages over older types of equipment in crushing efficiency and operating economy. Product size can be adjusted by changing speed of rotor, spacing of rods, distance between cast-manganese rings and periphery of rotor. Rock Busters are available in two sizes. Type 303 has a feed opening 30" square. Type 404 has a 40" opening.

Jeffrey Bulletin 854 gives full details.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

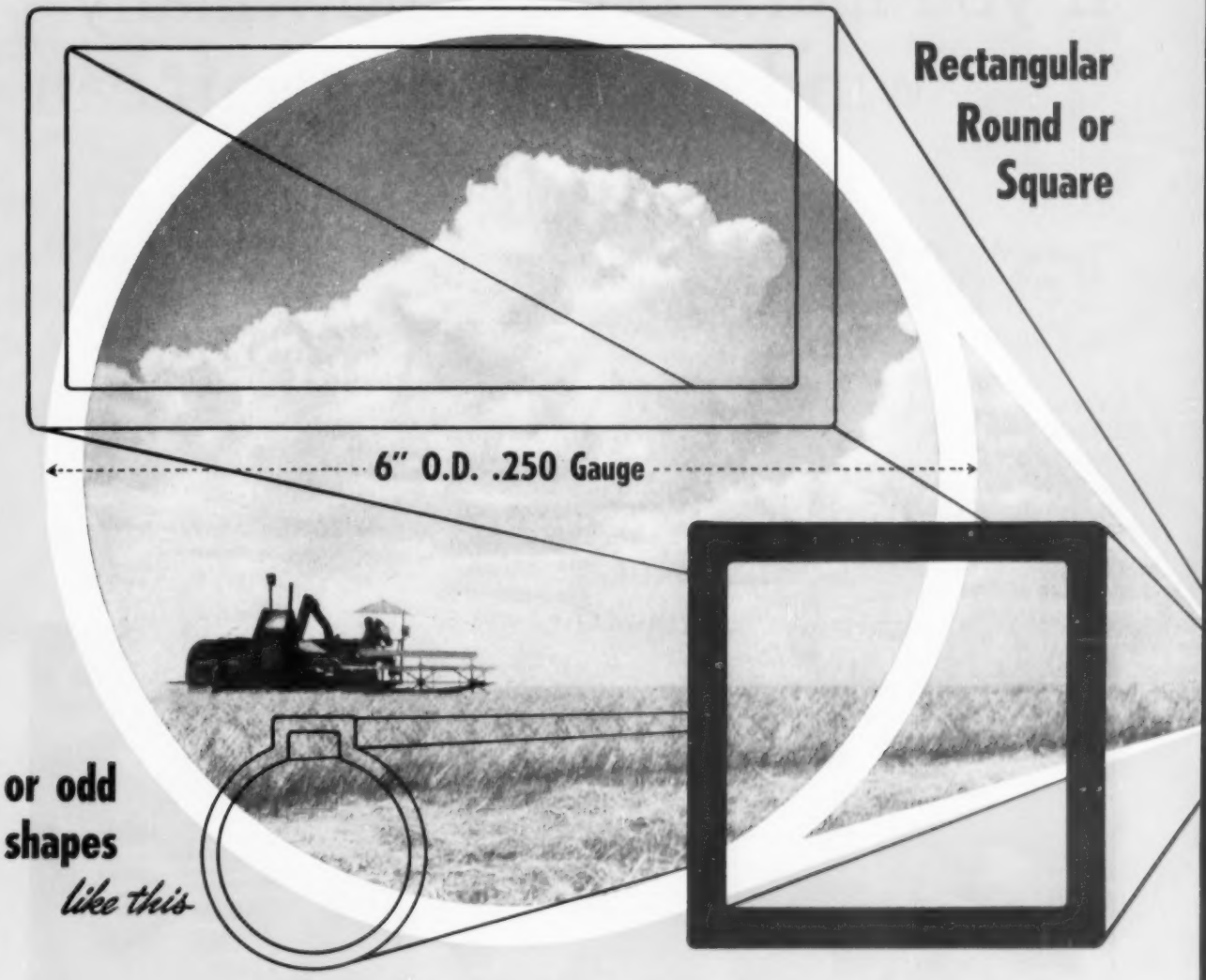
sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

Van Huffel Cold Formed Tubing *like this in*



is broadening farming horizons . . . .

Population growth figures show that within a few years every five acres of farmland will have to produce as much food as six acres do today. To meet this unprecedented challenge, new ideas, methods, materials and machinery will be exploited to the nth degree. Maybe now is the time to take a long, hard look at your products with these questions in mind: Can they be made better . . . faster . . . cheaper? Could Van Huffel Cold Formed Tubing be substituted for heavier, more costly materials now being used? We think we can answer that last question with hundreds of case histories and would welcome the opportunity of showing how you, too, can broaden your and farming's horizons.

Above are shown, actual size, a few Van Huffel basic products which include: Lock Seam, Tight and Open Seam, Welded Tubing; Standard or Special Formed Shapes in all metals and in any lengths. Sizes from 3/16" to 6" O.D. Gauges from .018 to .250.

Van Huffel
TUBE CORPORATION · WARREN, OHIO

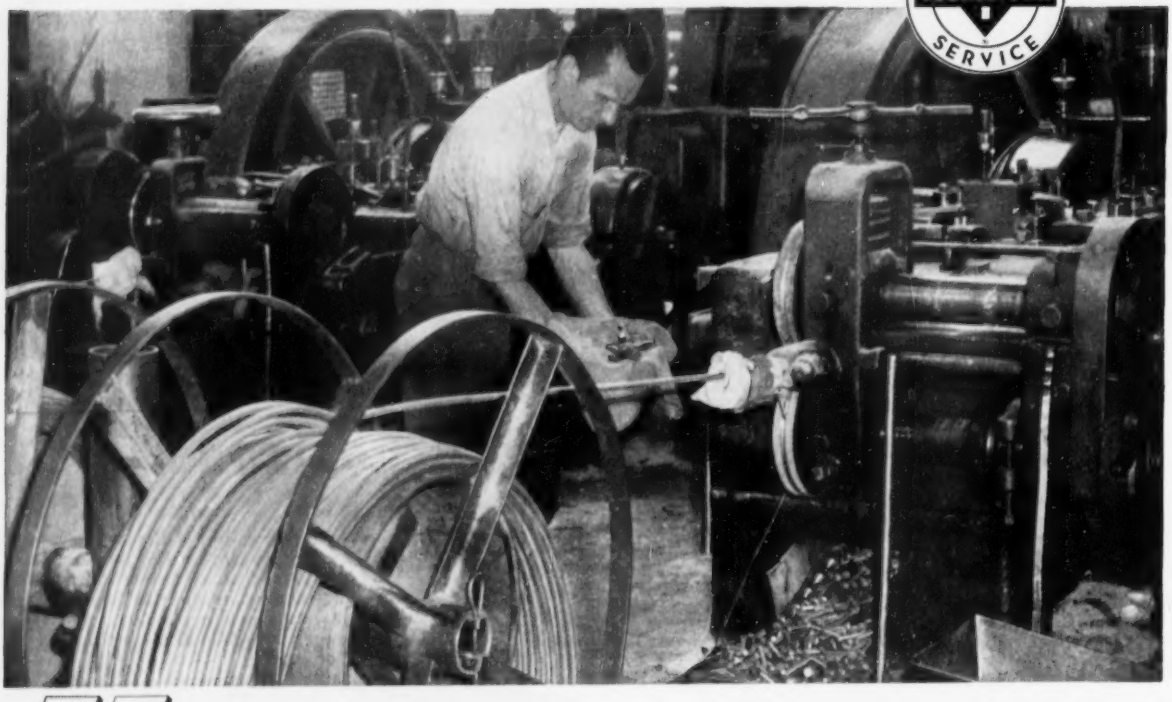
Where ideas take shape for makers of farm equipment

If you make bolts... how many wind up in your scrap can ... like this?

THE birth of a bolt is tough on steel. Cold headers chop it, pound it. Trimming and threading machines hand it another beating. If the steel is imperfect, bolts split. **Profits go into the scrap can!**

That's why shops like this one make their bolts from Youngstown Cold Heading Quality Bolt Wire or from wire drawn from Youngstown Cold Heading Quality Rods. Youngstown controls each step in steel making from the ore to the finished product. This control gives you top quality steel—free from injurious defects. Payoff comes when thousands of bolts come pouring from your machines—each one perfect and a profit maker! Call or write your nearest Youngstown office for quick service and information.

QUALITY V YOUNGSTOWN SERVICE

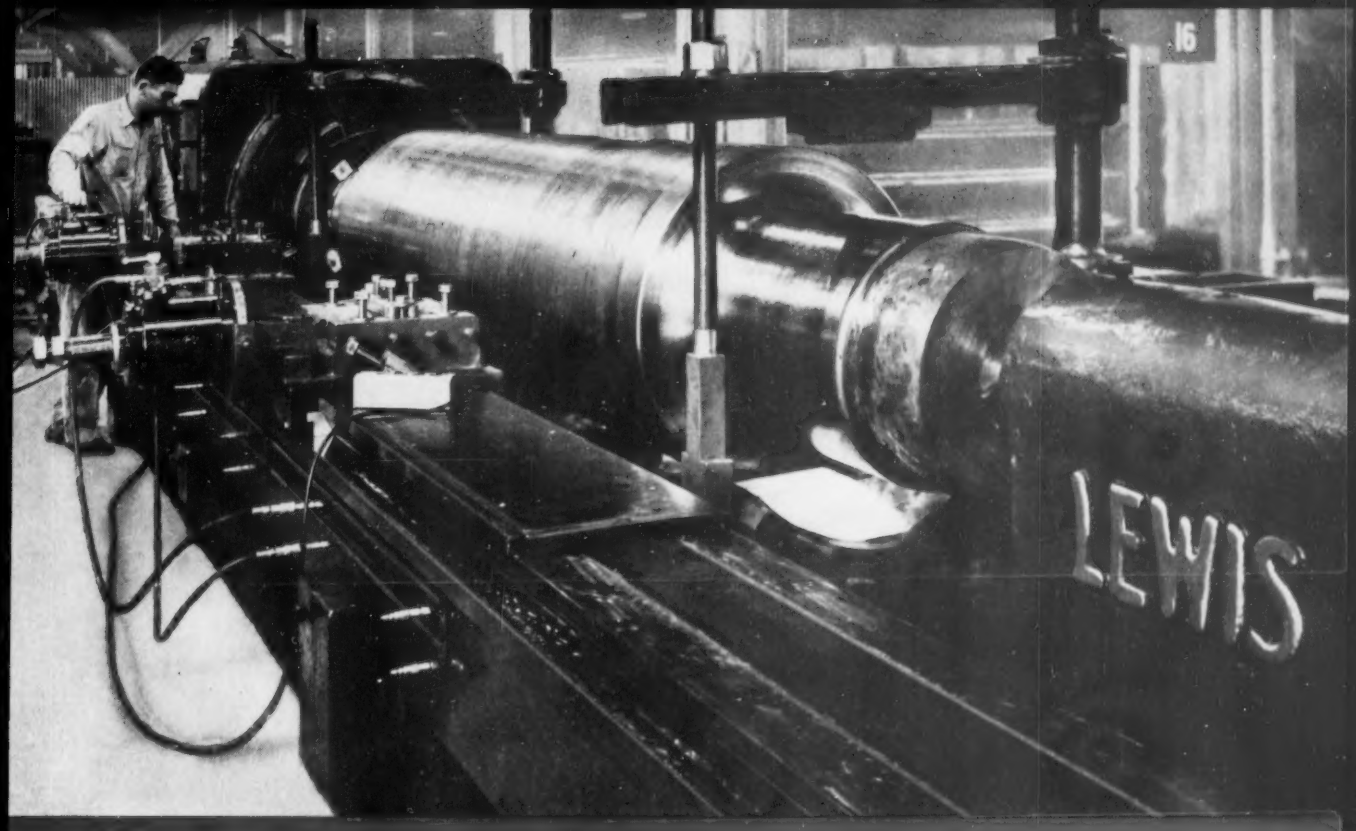


Youngstown COLD HEADING QUALITY WIRE AND RODS

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES



. . . reduces machining costs as much as 75 per cent

When you have to remove considerable metal, this new Lewis Hydraulic Roll Lathe reduces roll turning costs as much as 75 per cent.

By means of three hydraulically controlled movements, the roll machining operation is converted from a recurrent manual task to a practically continuous manual operation.

One—hydraulic control makes it possible in machining to use two tools, eight inches wide, with cuts up to ⅛ inch in depth, across the full face of the roll. And provides a constant, even pressure of the cutting tool against the roll, which increases tool life.

Two—lateral movement of the cutting tool enables the operator to make one continuous spiral cut that travels along the entire length of an even-faced roll . . . thereby eliminating unnecessary set-up time. Two tools can be used, cutting from the same side of the roll and traveling in the same direction. Traverse movement of the cutting tools can be in either direction.

Three—hydraulically controlled movement of the tailstock eliminates what used to be a difficult, time-consuming job that required the efforts of at least two men and sometimes the use of a crane.

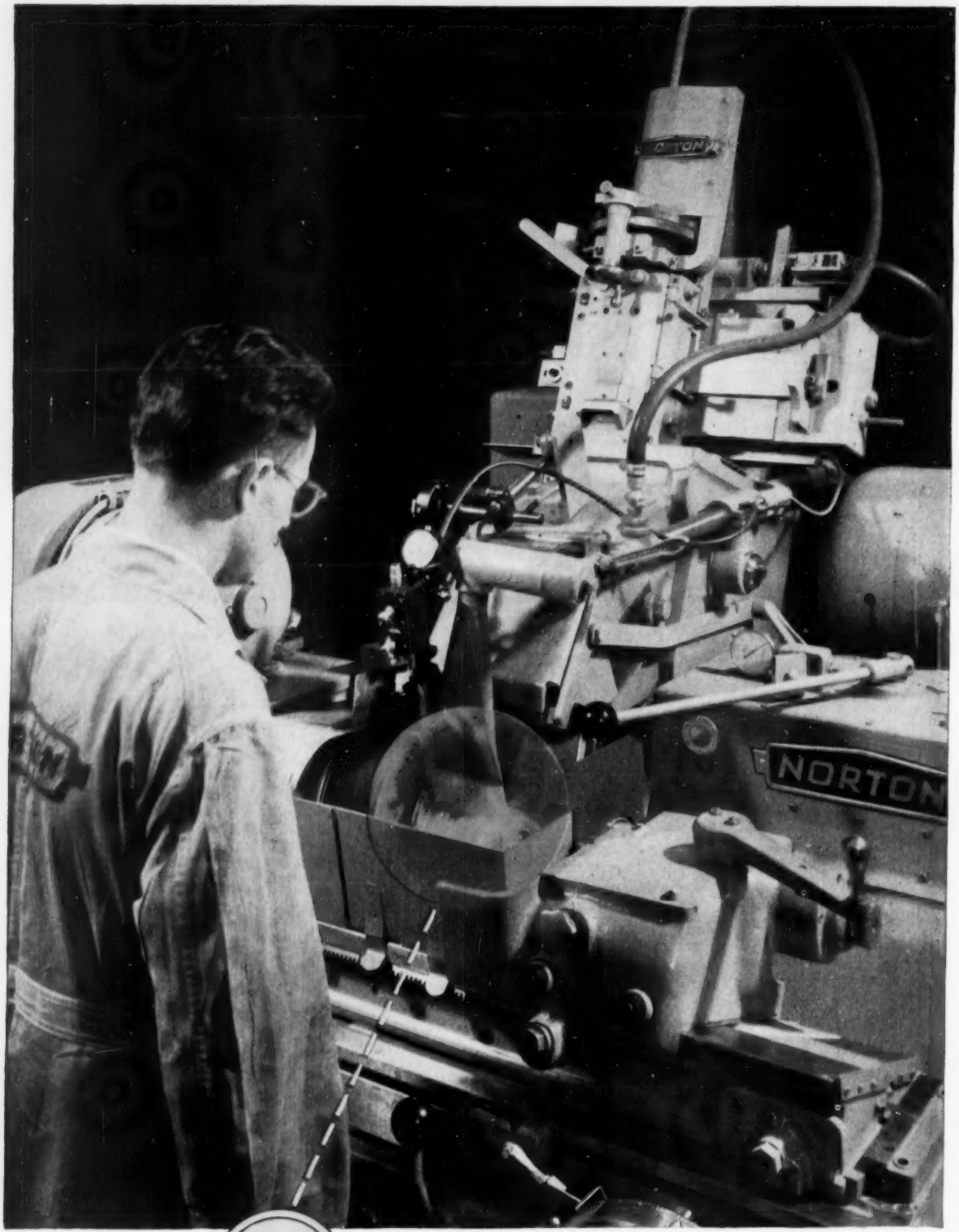
At your convenience we will be glad to give you more complete information about the design and performance of this new Lewis Hydraulic Roll Lathe . . . which can be built in any size to customer requirements. And to offer you the assistance of our experienced engineers and our manufacturing facilities to help you with any problem which includes rolling mill machinery.

new LEWIS hydraulic ROLL LATHE

BLAW-KNOX

BLAW-KNOX COMPANY • LEWIS MACHINERY DIVISION
PITTSBURGH 22, PENNSYLVANIA

LEWIS PRODUCTS: Two-High Mills • Three-High Mills • Four-High Mills • Bar and Billet Mills • Rod Mills • Coilers • Tables • Shears • Levelers • Pinion Stands • Gear Drives • Roll Lathes • Flaking Mill



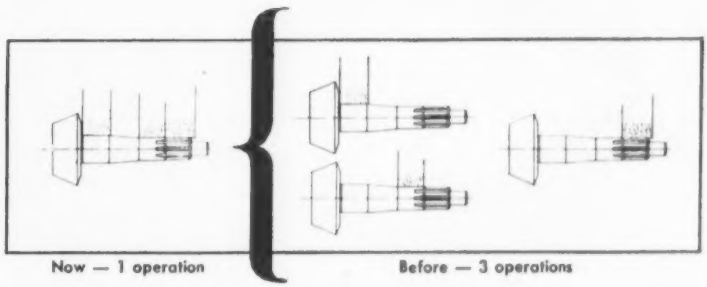
Up 128%

A big step forward in grinding operations, this Norton 10" Type CTU Semiautomatic Grinding Machine includes many advanced features. For example, the multi-wheel mount and automatic wheel guard type truing device help add the production-boosting, cost-cutting "Touch of Gold."

Now!...production increased 128% with this 3-way

"TOUCH OF GOLD"

A single Norton 10" CTU Semiautomatic replaces 3 separate grinders . . . cuts time, labor, costs



Here's an actual grinding job that shows clearly how advanced grinding techniques can reduce capital investment and step up production to new, profit-boosting highs.

THE PROBLEM. In producing an automotive part, a manufacturer was performing three separate grinding operations. Seeking to better his rate of 35 complete parts per hour per machine, he put his problem up to Norton engineers. They recommended replacing his three old-type machines with a single Norton 10" Type CTU Semiautomatic Grinder with multi-wheel mount and automatic truing device.

THE PAYOFF. Results were real eye-openers. The new Norton Grinder accurately performs all three operations at once . . . and produces 80 parts per hour for a rate increase of 128%!

Many examples of the "Touch of Gold"

That's just one of many instances of how Norton grinders and lappers assure the "Touch of Gold" that means sure savings in time, labor and money. There are many others. For example, another 10" Type CTU upped production from 300 to 600 parts per hour, replacing two old-type machines. And a 6" Type CTU more than doubled production of a part that previously required two separate grinding operations.

Why not add these advantages to your own production? Remember: only Norton offers you such long experience in both grinding wheels and machines to bring you the "Touch of Gold" — to help you produce more at lower cost.

For complete information, see your Norton Representative or write us direct. NORTON COMPANY, Machine Division, Worcester 6, Mass. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.

***To Economize, Modernize With* NEW**

NORTON

GRINDERS *and* LAPPERS

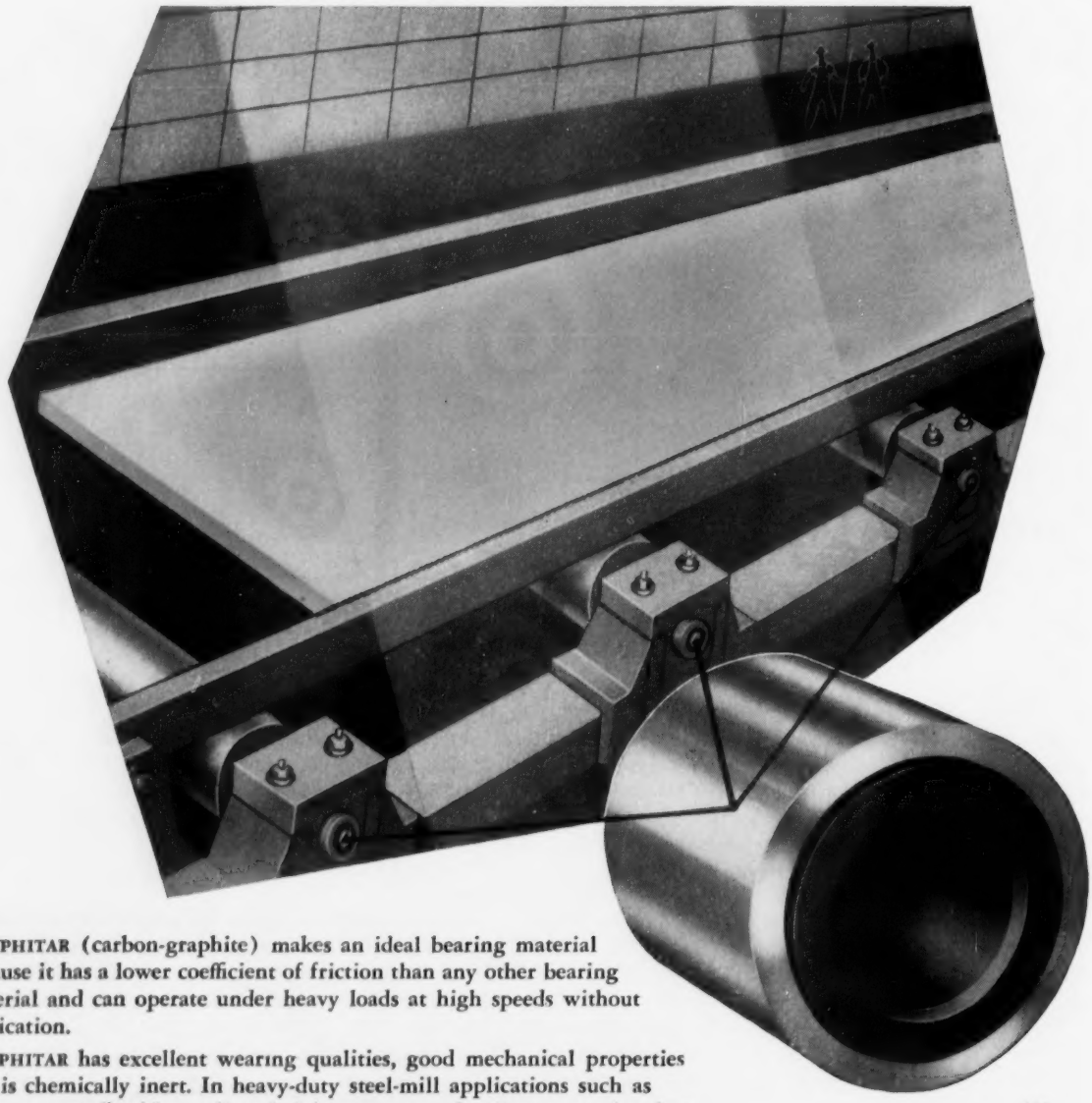
Making better products . . . to make other products better

District Sales Offices: Hartford • New York • Cleveland • Chicago • Detroit

GRAPHITAR®

METAL-BACKED BEARINGS FOR THE STEEL INDUSTRY

Metal-backed GRAPHITAR bearings provide exceptional strength and durability for long life in difficult steel mill applications



GRAPHITAR (carbon-graphite) makes an ideal bearing material because it has a lower coefficient of friction than any other bearing material and can operate under heavy loads at high speeds without lubrication.

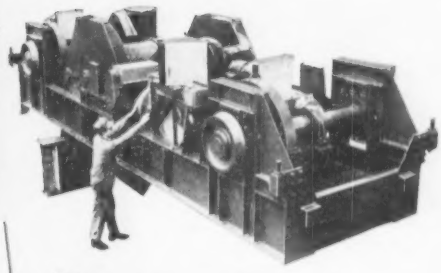
GRAPHITAR has excellent wearing qualities, good mechanical properties and is chemically inert. In heavy-duty steel-mill applications such as shear or cut-off tables, coil and slab conveyors, the GRAPHITAR bearings are metal-backed to provide additional strength and resistance to shock. GRAPHITAR metal-backed bearings can be supplied in tolerances as close as .0005" ready for installation.

183

OUR 100th YEAR

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION • SAGINAW, MICHIGAN



Step up your bridge capacity with a new Dravo Man Trolley..

Is your production slowed down because your bridge can't handle the tonnage you need?

Actually, it isn't always necessary to invest in a new bridge to correct this lag. Often an existing structure can be modernized easily by replacing the present man trolley with a light-weight Dravo-built unit.

The operation is practical and requires a minimum of bridge-downtime. One recent installation was completed within eight hours.

Replacement of inefficient, worn or inadequate trolleys can improve your operations at a fraction of new bridge cost. Consultation with a Dravo engineer does not obligate you in any way—and may help you eliminate a production bottleneck. Write or phone . . .

DRAVO

DESIGNERS *and* BUILDERS

BRIDGES AND UNLOADERS • TOWER-TYPE UNLOADERS
WHIRLER CRANES • FLOATING CRANES
DRAVO RAIL CLAMPS • BARGE SHIFTERS
MODERNIZED TROLLEYS FOR EXISTING BRIDGES

DRAVO
CORPORATION

NEVILLE ISLAND, PITTSBURGH 25, PENNSYLVANIA

AIR CONDITIONING • BOILER AND POWER PLANTS • CRANE CAB COOLERS • DOCKS • INDUSTRIAL FOUNDATIONS • OPEN STEEL FLOORING
PUMP HOUSES AND INTAKES • SPACE HEATERS • WATER AND WASTE TREATMENT PLANTS • TOWBOATS AND BARGES

where only the right steels work

J&L sheet and strip

serving steel users everywhere

linked by water to the Middle West and South

J&L's nation-wide distribution is supported by its location and facilities for prompt, dependable river, rail, and truck shipments.

Your particular requirements for formability, uniformity, and drawing qualities determine every step in the production of your order of J&L Sheet and Strip.

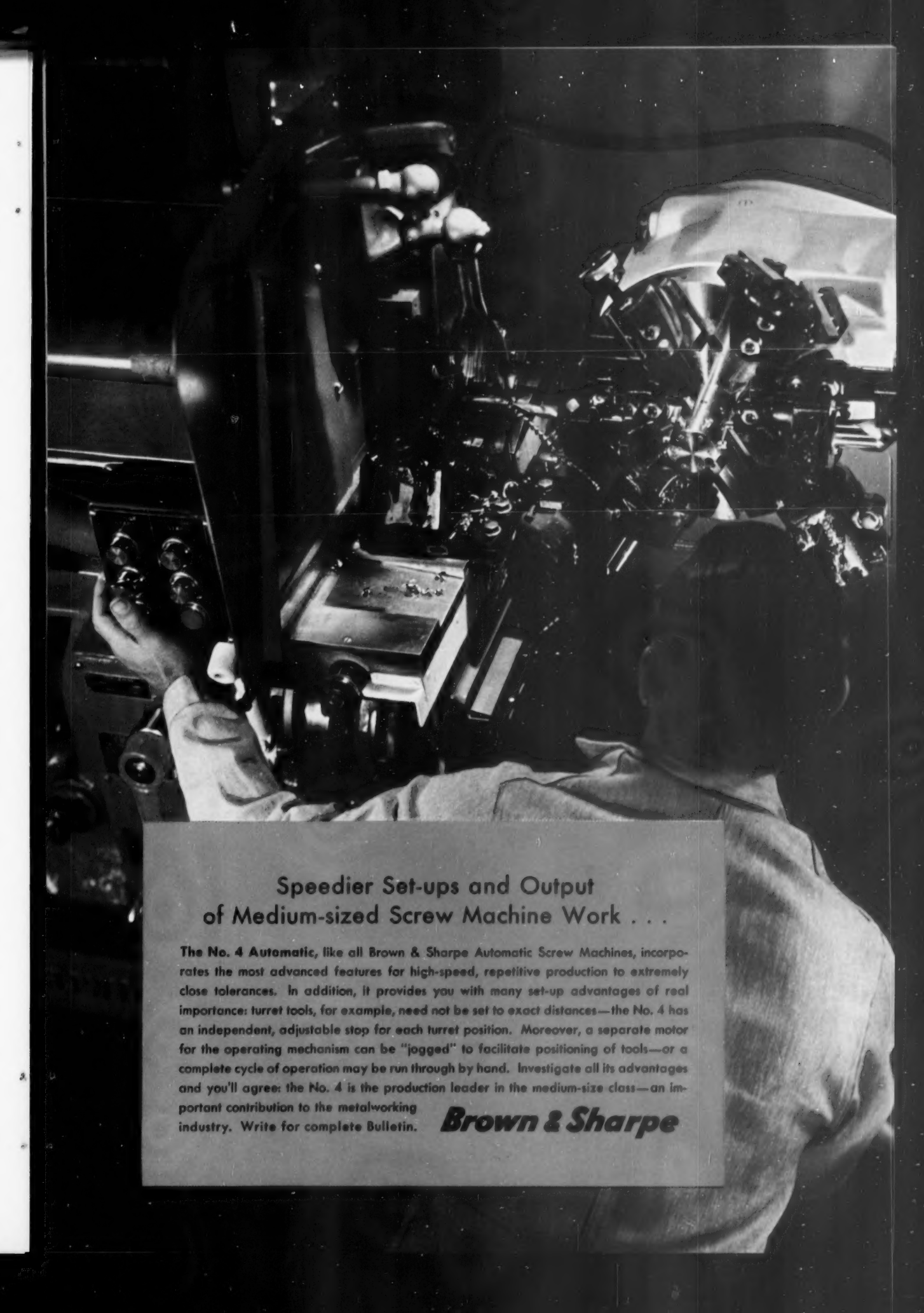
An understanding of product end use, and the physical and chemical properties required to do the job, are the foundation for J&L quality control practices. And J&L quality control assures accurate adherence to your specifications.

You can depend on J&L for Sheet and Strip Steel that helps you get the best out of high speed production equipment . . . adds to the value of your finished product.

Jones & Laughlin

STEEL CORPORATION — *Pittsburgh*

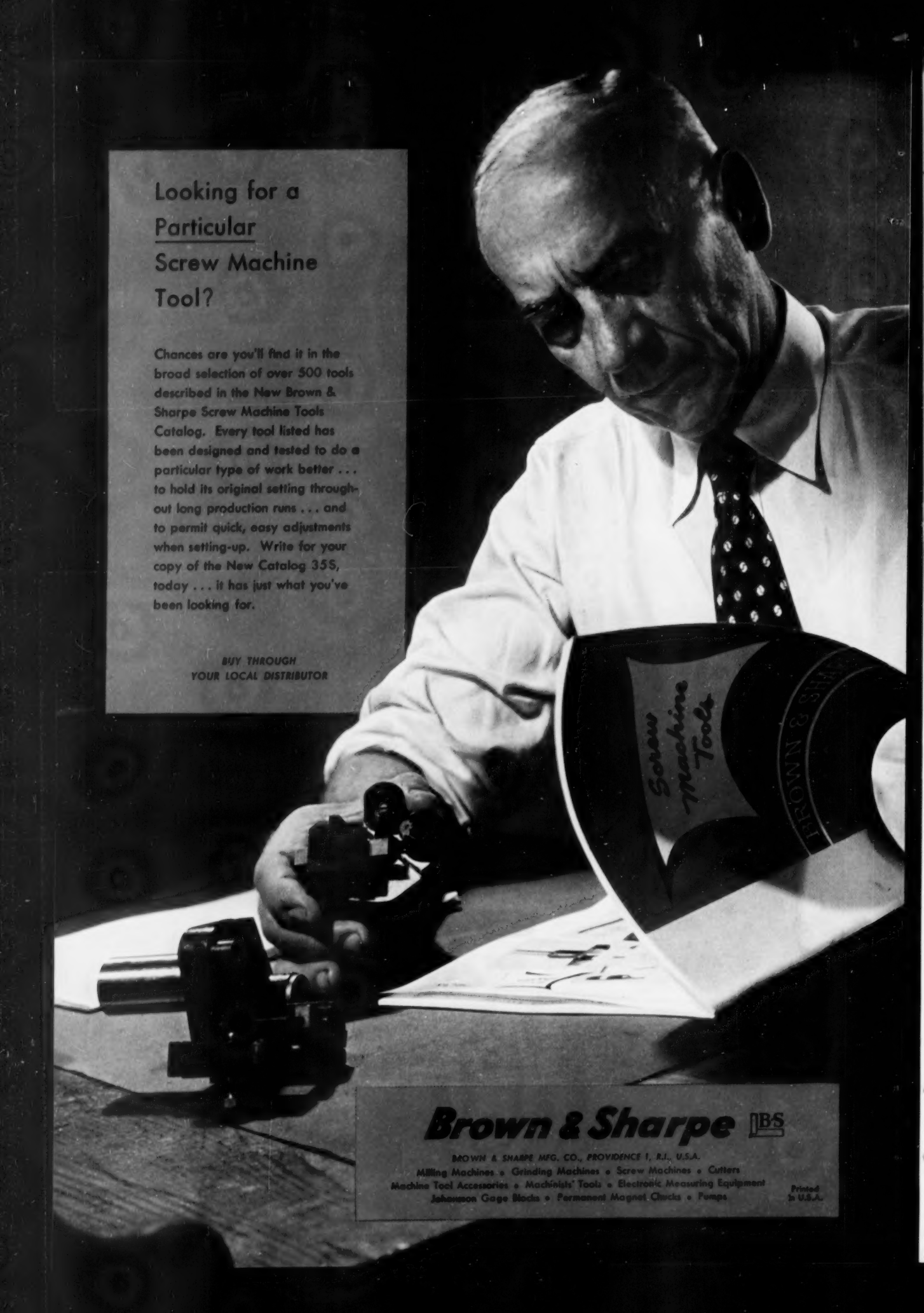
J&L STEEL



Speedier Set-ups and Output of Medium-sized Screw Machine Work . . .

The No. 4 Automatic, like all Brown & Sharpe Automatic Screw Machines, incorporates the most advanced features for high-speed, repetitive production to extremely close tolerances. In addition, it provides you with many set-up advantages of real importance: turret tools, for example, need not be set to exact distances—the No. 4 has an independent, adjustable stop for each turret position. Moreover, a separate motor for the operating mechanism can be "jogged" to facilitate positioning of tools—or a complete cycle of operation may be run through by hand. Investigate all its advantages and you'll agree: the No. 4 is the production leader in the medium-size class—an important contribution to the metalworking industry. Write for complete Bulletin.

Brown & Sharpe


Looking for a Particular Screw Machine Tool?
Chances are you'll find it in the broad selection of over 500 tools described in the New Brown & Sharpe Screw Machine Tools Catalog. Every tool listed has been designed and tested to do a particular type of work better . . . to hold its original setting throughout long production runs . . . and to permit quick, easy adjustments when setting-up. Write for your copy of the New Catalog 35S, today . . . it has just what you've been looking for.
BUY THROUGH YOUR LOCAL DISTRIBUTOR
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Milling Machines • Grinding Machines • Screw Machines • Cutters
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INTRODUCING

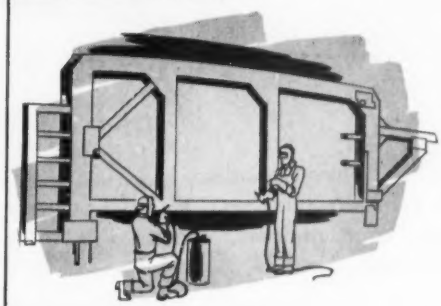
SPEEDEX

the new MUREX® "Contact" Electrode

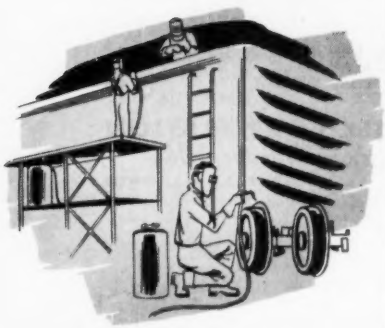
— crowning achievement in the use of powdered metal in Murex electrode coatings over the past twenty years.

● *Very high deposition rates—up to 25% higher than regular mild steel electrodes—effects real savings in welding costs.*

● *Easy to use—employ drag technique if desired, or use free arc as with conventional electrodes.*



● *Smooth, steady arc on A-C or D-C—little spatter—easy slag removal.*



● *Strong clean welds—85,000 to 90,000 psi tensile with 15% to 20% ductility—good surface appearance—fine ripple—practically no undercutting.*

METAL & THERMIT CORPORATION
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Gentlemen:
Please send me technical data on "SPEEDEX". ☐ We would like to see "SPEEDEX" demonstrated. Call us for a convenient time. ☐

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*CITY*_____ *ZONE*_____ *STATE*_____

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100 East 42nd Street, New York 17, N. Y.

MUREX ELECTRODES • ARC WELDERS • ACCESSORIES

"Yes...you can make it in stainless. Free-Machining ENDURO is fully 90% as machinable as Bessemer screw stock"

You can give parts the high physical and chemical properties of ENDURO Stainless Steel—and, at the same time, maintain high rates of automatic production.

You do it by converting to ENDURO bars which are cold-finished by Republic's Union Drawn Steel Division. Two grades are fully 90% as machinable as Bessemer screw stock.

They offer close tolerance, accuracy of section, uniform soundness, and fine surface finish.

Republic ENDURO Stainless Steel also is available in hot-rolled bars and in wire. And, Republic metallurgists are ready to help you every step of the way in selecting and applying the proper grades for best production. Just write:

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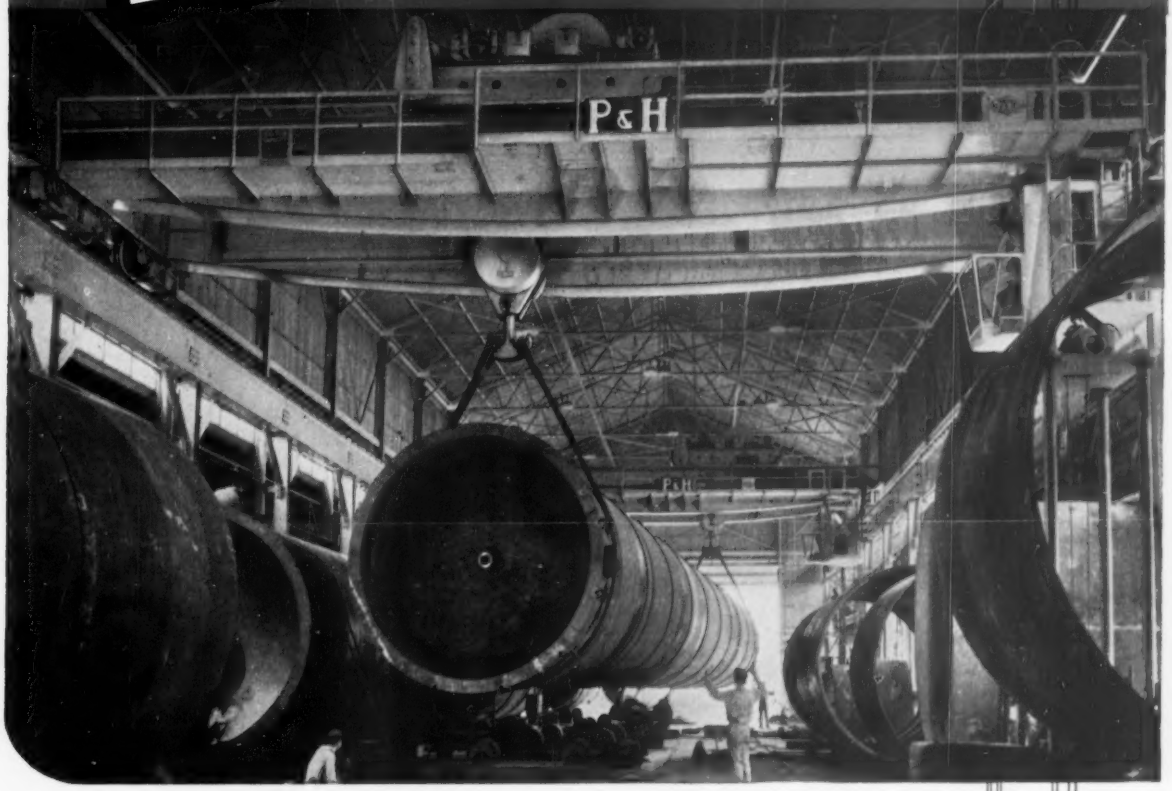
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic ENDURO®
FREE-MACHINING
STAINLESS STEEL

REPUBLIC STEEL®

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

P&H OVERHEAD CRANES



Why P&H builds the entire Crane

. . . including electrical equipment!

If you want the utmost in service from your cranes, insist that they be job *engineered* by P&H — not an assembly of components from various sources. For example, general purpose electric motors don't stand the gaff of crane service like those *designed* for the job. That's why P&H builds its own motors, brakes and controls — with all characteristics *properly suited* to crane operation: P&H electrical equipment throughout is your assurance that all functions are perfectly coordinated. It means better service, less maintenance.

This policy of complete quality control — of single manufacturing responsibility — better service — made P&H the leading builder of overhead traveling cranes. Continuous improvement, far ahead of the field, has extended this leadership. Benefit by it when you buy your next cranes.

*T.M. of Harnischfeger Corporation for electromagnetic type brake.

P&H OVERHEAD CRANE DIVISION

HARNISCHFEGER CORPORATION

Milwaukee 46, Wisconsin

P&H MAGNETORQUE* AC Crane Control is the most important development in crane service in 25 years.

the P&H Line

TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

The CECO-DROP makes other gravity drop hammers obsolete

Builders of THE IMPACTER

"FORGING IN MID-AIR"

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

INTRICATE FORMING

Weirton hot-rolled strip steel is the ideal material for forming intricate shapes. It has all the qualities that define *ductility*, meaning the ability to perform well in tough draws, deep draws, draws into all kinds of intricate shapes. Next time your plans call for a steel strip capable of the most complicated forming—call Weirton and be sure.

hot rolled strip steel from WEIRTON STEEL COMPANY

Weirton, West Virginia

WEIRTON STEEL COMPANY

NATIONAL STEEL CORPORATION

For Special Operations in Steel Mills...

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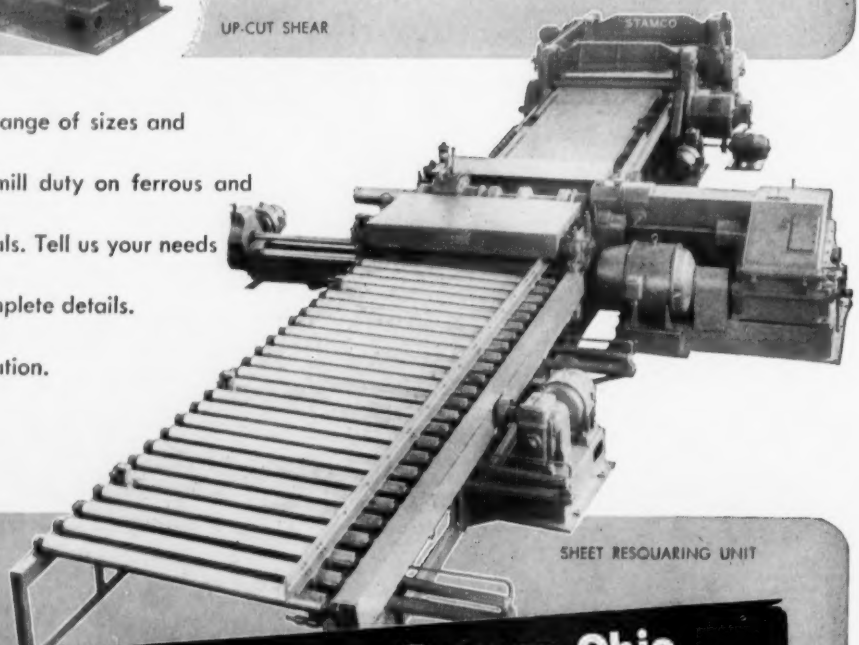
Stamco

for the equipment you need

Available in a wide range of sizes and speeds for warehouse and mill duty on ferrous and non-ferrous materials. Tell us your needs and we'll give you complete details.

No obligation.



SHEET RESQUARING UNIT

• LAY YOUR SHEARING PROBLEMS AT STAMCO'S DOOR •

STAMCO, Inc., New Bremen, Ohio

HE has it...

the thing you want!

NO NEED to search through directories or ask people about it. When you need a finished bearing, a bar of bearing bronze or any other one of countless items of industrial materials and equipment, just phone your industrial distributor.

YOUR BUNTING distributor is the leading industrial distributor, or a stock-carrying specialist in certain industrial items. With money-saving convenience, he can supply hundreds of different sizes of completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars.

Ask him for a Bunting Catalog which gives complete dimensional and technical data.

Bunting®

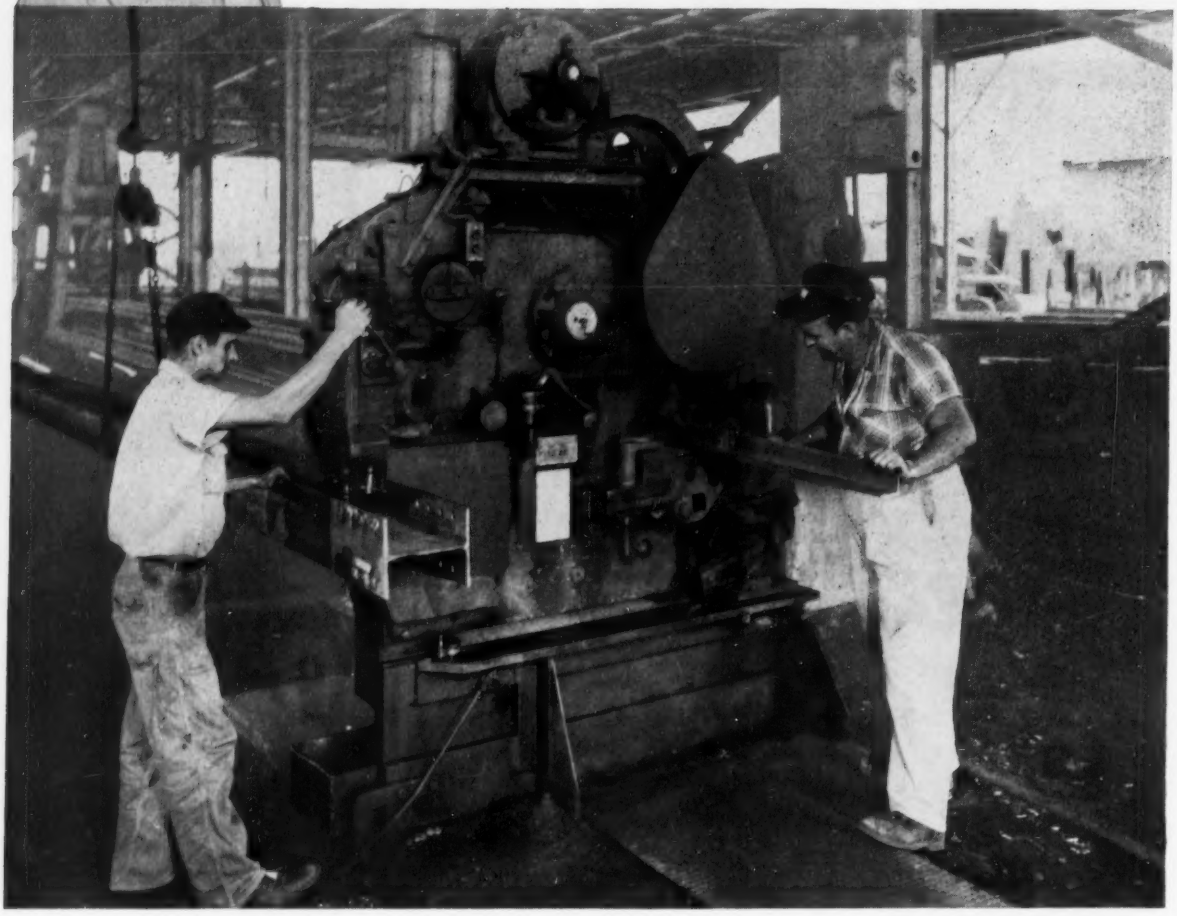
BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

The Bunting Brass & Bronze Company • Toledo 1, Ohio • Branches in Principal Cities • Distributors Everywhere

"So popular with our shop men it's overworked to the neglect of our several other punch and shear machines. In fact, so much that I have ordered another."

Writes *L. A. Delisle* Shop Superintendent Bushnell Steel Works, Inc., Tampa, Florida

—about his "BUFFALO" UNIVERSAL IRON WORKER



ONE MACHINE DOES UP TO 5 FABRICATION JOBS

What Mr. Delisle's men like about the U.I.W. is that you can do a whole shop-full of fabrication jobs on a work piece without travelling from machine to machine. You can do a wide variety of punching—such as the Bushnell man above is doing on the I-beam web and flange —while another man can be mitering angles or tees 90° or 45°, cutting round or square bars, cutting flats, slitting or notching at the same time. Small wonder so many users of "Buffalo" Universal Iron Workers call them the "most useful machines in the shop". Why not write for Bulletin 360-E and look into these durable, multi-purpose machines that will save space, dollars and hours in your shop?

"Buffalo"

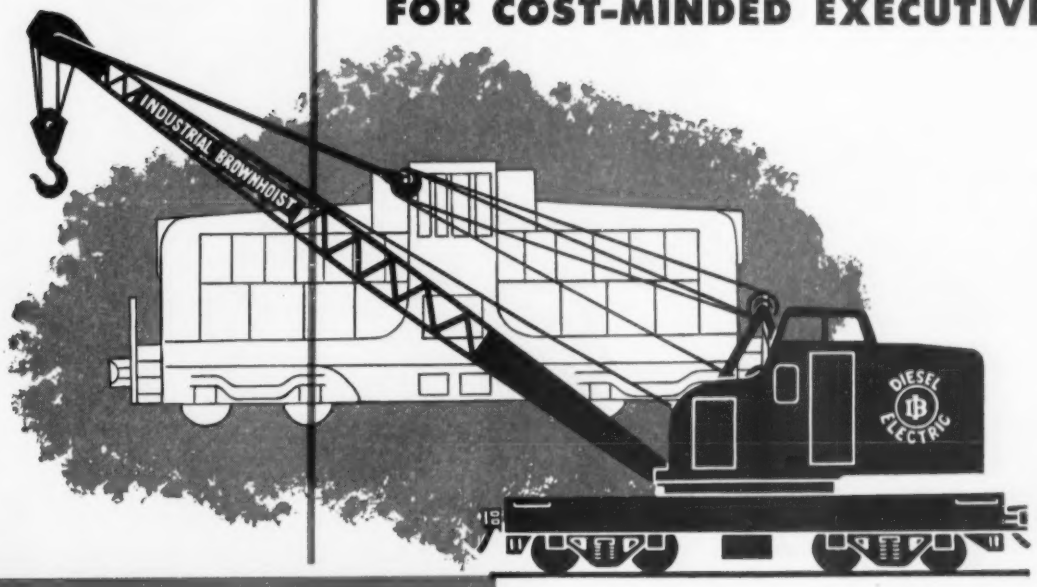
BUFFALO FORGE COMPANY

158 Mortimer St. Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING CUTTING BENDING

NEW ARITHMETIC
FOR COST-MINDED EXECUTIVES



1 + 1 = 1 BROWNHOIST

(SWITCH ENGINE) (LOCOMOTIVE-CRANE) DIESEL ELECTRIC LOCOMOTIVE-CRANE

Many railroads, steel mills and manufacturing plants have long been familiar with the powerful, efficient performance of Brownhoist Diesel Electric Locomotive-Cranes in handling bulk materials with magnet, hook or bucket. Brownhoist Cranes also perform equally well as switch engines because they are built with a specially designed travel generator, motor and axle reduction unit — the same equipment used in modern switching locomotives to provide high tractive power and rapid acceleration. These two dependable pieces of equipment in one husky unit mean greater versatility and economy of operation.

Brownhoist Cranes save you man hours, production time and money. The patented Monitor Type Cab and Clear-Vision Boom give the operator unlimited visibility in all directions and help him turn out a greater volume of work in less time. Sound, rugged construction plus a simplified mechanism and easy accessibility to all moving parts help keep maintenance and repair costs low.

Brownhoist Cranes are built in capacities from 25 tons to 80 tons for virtually every heavy duty materials handling operation. For complete information, consult your nearest Brownhoist representative or write us today.

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago; Canadian Brownhoist, Ltd., Montreal, Quebec • **AGENCIES:** Detroit Birmingham, Houston, Los Angeles

BROWNHOIST

BUILDS BETTER CRANES

166

"Sure, I'm Top Brass— and mighty proud of it, too!"

The Brass

The new doorknobs on the Pentagon are brass, and GIs who recall the frosty remarks of some high ranking officers about their use of the term will get many a chuckle out of the change.

The old hardware on the main entrances was cast iron but it was rusting away and the building managers were reported to have received complaints about broken fingernails from some of the personnel. Since a taut military organization can't handle paperwork properly or even stand a passable inspection, on or off duty, under such conditions, we think the change is all for the better.

But we never could see the objection to the word "brass" as applied to the higher military echelon by those of lower rank. The term not only has a ring of authority to it, there is even good authority for its use. It comes from "brass hat" and Webster tells us that this means "a general or staff officer; — from the ornamental gold braid on the cap. *Slang.*" So those who want to try to stop use of the term must first stop using brass all over themselves and leave it for the doorknobs.

Even so some other descriptive terms will come about. A little poke at pomp and circumstance is part of a citizen military establishment. Any soldier who laughs at himself as nothing but "government issue" along with the guns and rations is not going to stop there.

Further, if the present GIs indulge in the same unrestrained nomenclature we remember, ranking officers ought to be happy to settle quickly for just brass.

Editorial from the WALL STREET JOURNAL

BRASS *opens the door to the solution of countless problems in fabrication and use. And Bristol has an exceptional record of 104 years as a dependable supplier of top-quality strip, wire, and rod. In fact—*

"*Bristol-Fashion*" *means* **Brass at its Best**

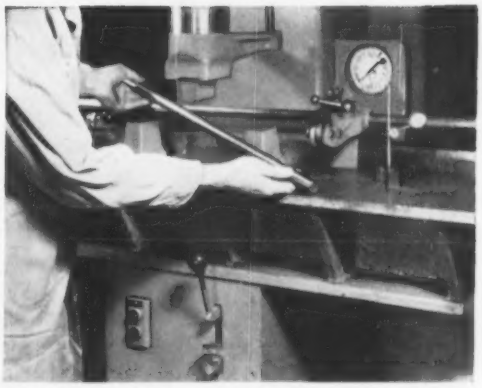
THE BRISTOL BRASS CORP., BRISTOL, CONN. OFFICES OR WAREHOUSES IN PRINCIPAL CITIES

WITH HANNIFIN PRESSES

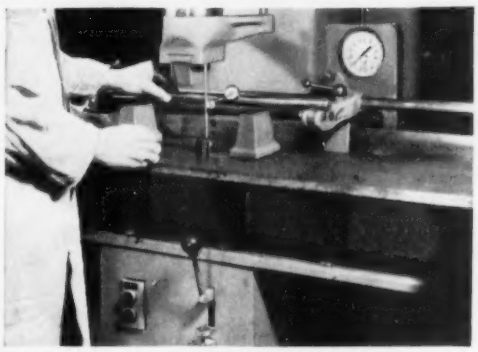
YOU STRAIGHTEN BY EYE!

HERE'S HOW AND WHY:

See how easy and quick straightening operations are with Hannifin Hydraulic Straightening Presses. The answer is Hannifin's exclusive, Sensitive Pressure Control . . . so sensitive that a touch of the finger causes the press to respond. With it an operator quickly becomes skilled at "straightening by eye." Ability to stop . . . re-start . . . or retract assures safety. Capacities to 150 tons. Investigate how to speed work . . . improve uniformity with Hannifin Straightening Presses. Hannifin Corporation, 1123 S. Kilbourn Ave., Chicago 24, Ill.

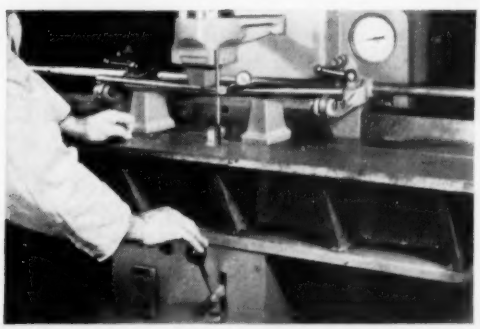


1. Rod to be straightened is placed in fixture on Hannifin 25-ton Straightening Press.* Centering fixture available.

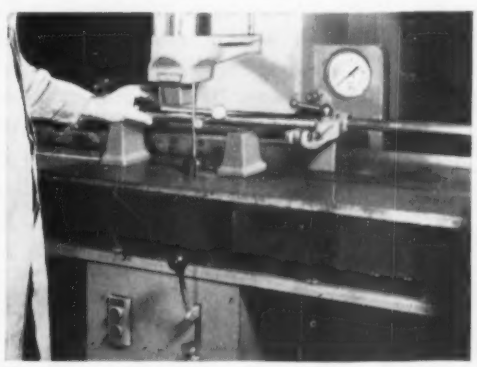


2. Operator rotates rod against deflection indicator. Dial reads .008 at point of maximum deflection.

3. Operator moves Sensitive Pressure Control slightly, ram moves down just enough to overcome springs of roller fixture and bring rod down on table blocks. (Note pressure gauge has barely moved off zero.)



4. Now operator "straightens by eye." Light finger touch bends rod just beyond yield point so it will take permanent "set" in desired direction. (Gauge shows press exerting force of 6 tons—but operator watches rod—not gauge.)



5. Sensitive Pressure Control is released and rod again rotated against indicator . . . deflection is .001, well within limits. Next piece!

NOTE: For simplicity, we have assumed that the operator got exactly the correction he needed on one try. While this often happens, the usual sequence is bend and try, bend and try. As you can see, however, successive bends can be made very quickly.

*While a much smaller press could be used for this particular job, notice how the extra sensitivity of Hannifin controls makes it possible to do a wide range of straightening work on a single press.

Hannifin Representatives Are at Your Service in These Leading Industrial Centers

Atlanta, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Houston, Los Angeles, Milwaukee, Minneapolis, Moline, New Orleans, New York, Philadelphia, Pittsburgh, Richmond, Va.; Rochester, N. Y.; St. Louis, Seattle, South Bend, Ind.; Washington, D. C.; Worcester, Mass. In Canada, F. F. Barber Machinery Co., Toronto, Montreal, Windsor, Hamilton, Vancouver.

HANNIFIN

Hydraulic Presses • Pneumatic Presses • Hydraulic Riveters
Hydraulic Cylinders • Air Cylinders • Air Control Valves

WRITE FOR BULLETIN 130

Hannifin Corporation, 1123 S. Kilbourn Ave., Chicago 24, Illinois
Please send me Bulletin 130 on Hannifin Hydraulic Presses. I understand it includes information on Hannifin Straightening Presses.

Name.....

Position.....

Company.....

Address.....

City.....*State*.....

LEES-BRADNER MODEL R
HEAVYWEIGHT HOBBER
Maximum Outside Dia. . . . . 16"
Travel . . . . . 18"
Maximum Helix . . RH 45°—LH 60°
Machine Weight . . . . 13,000 lbs.
Motor Requirements . 15 to 25 HP

Will the Machines You Buy Today Fill Tomorrow's Needs?

How about that machine you're thinking of replacing today? Awhile back it looked pretty good, didn't it? Good enough to fill your needs when you bought it, anyway. But now it can't handle today's job and it must be replaced.

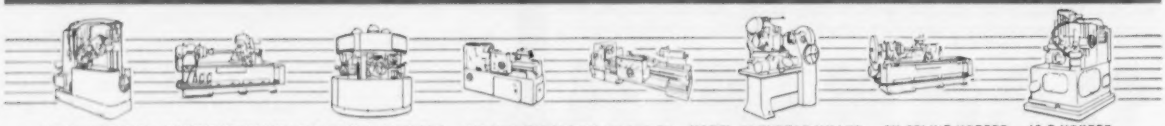
When you buy that new machine—*look ahead.* Don't invest in one that just barely meets today's needs. Think about that extra capacity you'll probably need tomorrow.

Lees-Bradner manufactures a full line of hobbing machines to meet different requirements. If a smaller capacity machine will do your job today—*and tomorrow*—fine, that's for you.

But if you suspect you'll need higher speeds, faster feeds and greater production capacity in the near future it's wise to gear your thinking and purchasing accordingly.

the LEES-BRADNER *Company*

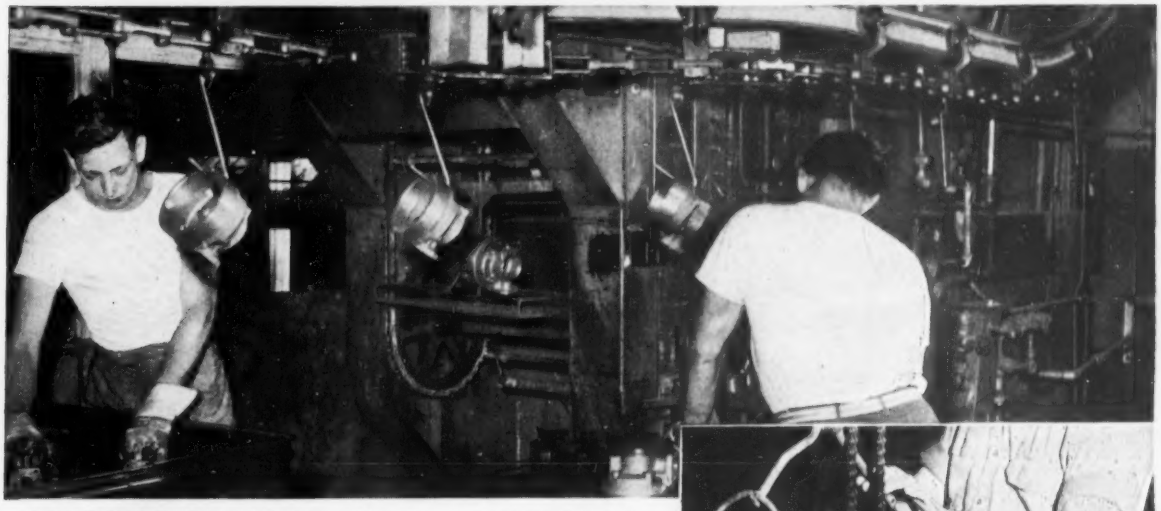
CLEVELAND 11, OHIO, U.S.A.



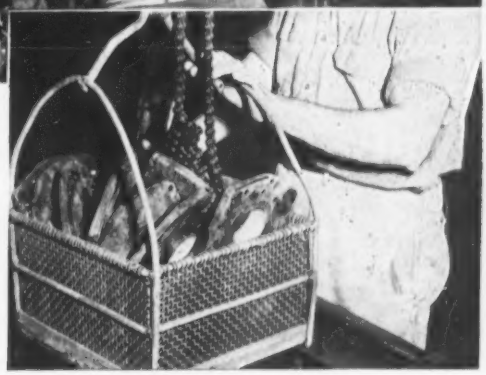
MODEL R HOBBER · HT THREAD MILLER · 7-A ROTARY HOBBERS · CRI-DAN THREADING MACHINES · MODEL 40 THREAD MILLER · SH SPLINE HOBBER · 12-S HOBBER

IF YOU THREAD OR HOB . . . GET A BETTER JOB WITH A LEES-BRADNER

THE SOLVENT DESIGNED FOR MODERN VAPOR DEGREASING



CONVEYORIZED. "Triclene" D cleans refrigerator motor parts speedily and economically on a production line basis.



MANUALLY OPERATED. Castings will emerge clean, warm and dry from this small basket degreaser—instantly ready for assembly or further fabrication.

DU PONT "TRICLENE" D

(TRICHLORETHYLENE)

speeds conveyor and manual operations

You can't buy a better solvent for modern vapor degreasing than "Triclene" D. Whatever your present degreasing requirements are, rugged "Triclene" D assures you perfect solvent performance. That's because "Triclene" D has been carefully developed over the past twenty years—ever since Du Pont pioneered synthetic solvents for vapor degreasing—and is specifically designed to meet today's varied cleaning tasks.

Stable and pure "Triclene" D gives excellent results in high-speed degreasing operations—even those involving removal of the newer, chemically active lubricants. Its narrow boiling range permits easy solvent recovery from sludge for efficient re-use. And to help keep your *entire* metal cleaning operation at peak efficiency, Du Pont field men will gladly give you the benefit of their technical experience.

THIS VALUABLE INFORMATION IS YOURS—FREE

You'll find complete information on the operation and maintenance of vapor degreasing equipment in these booklets. And interesting, up-to-date case histories about degreasing units in operation throughout the metal field are presented in our publication, "MODERN METAL FINISHING." You can receive this wealth of information by checking the appropriate boxes in the coupon below and returning it to us.

E. I. du Pont de Nemours & Co. (Inc.) S-28
Electrochemicals Dept., Wilmington 98, Del.

Please send me more information on vapor degreasing and "Triclene" D. I am interested in receiving the literature checked below.

- ☐ **Free booklets on vapor degreasing**
- ☐ **Free publication "MODERN METAL FINISHING"**

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DU PONT
first in solvents for
VAPOR DEGREASING

DU PONT REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

The wings on which he flies will have been made possible by quality ferro-alloys

OHIO FERRO-ALLOYS CORP.

CANTON, OHIO

SERVING THE IRON AND STEEL INDUSTRY FOR A QUARTER CENTURY

DEPENDABILITY • QUALITY • SERVICE

Here's

BALANCED PRODUCTION

SIMPLE LOADING

AUTOMATIC CLAMPING

the American WAY

SIMPLE LOADING plus AUTOMATIC CLAMPING gives the manufacturer of these connecting rods and caps BALANCED PRODUCTION at the rate of 300 complete assemblies per hour.

The installation, engineered the American-way, consists of a Standard American 10-ton, 42-inch stroke vertical duplex hydraulic broaching machine and two, two-station fixtures mounted on completely automatic tilting-type work tables. Fixtures are interchangeable. One station on each fixture holds a rod part, the other a cap. The operator simply PLACES a rod and a cap on the first fixture . . . then pushes the control buttons. The parts are CLAMPED AUTOMATICALLY while the table tilts down and then broached. While one assembly is broached the operator loads the other fixture.

AMERICAN CAN HELP YOU SOLVE YOUR PRODUCTION PROBLEMS

Just as American has helped thousands of other manufacturers during the past twenty-five years, they can help YOU solve your production problems. For the answer to your problems send a part-print or sample and hourly requirements. Address Dept. S.

WRITE TODAY *for your copy of American's Circular No. 300 on American Vertical Hydraulic Surface Broaching Machines.*

AMERICAN

American BROACH & MACHINE CO.

A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

ANN ARBOR, MICHIGAN

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See American First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

Only The Commercial Heat Treater Can Give You Complete Service...

"Custom Tailored"

To Meet Your Specifications

A Member of MTI Is a Leader in the Field Known for Quality—Service—Technical Ability

The reasons for the growth and national acceptance of the commercial heat treating industry are numerous, but fundamentally are based upon one important factor namely "Completeness of Service" from A to Z — all under one roof.

Of equal importance is the fact that this very versatility automatically with time creates an equally wide variety of skills — skills in handling and processing all types of heat treating from simple stress relief to delicate controlled atmosphere hardening, nitriding, etc.

In the true sense of the word your commercial heat treater is a "Specialist" with his entire organization established and built around "*Service.*"

The members of the Metal Treating Institute are the recognized leaders of the field and comply with the high quality standards established by such a group.

If you are faced with heat treating problems or the need for heat treating services consult your Commercial Heat Treater.

There's a Heat Treating Specialist Near Your Plant

Ace Heat Treating Company
Elizabeth, New Jersey
Anderson Steel Treating Co.
Detroit, Michigan
Benedict-Miller, Inc.
Lyndhurst, New Jersey
California-Doran Heat Treating Co.
Los Angeles 23, California
Commercial Metal Treating, Inc.
Bridgeport, Conn.
Commercial Steel Treating Corp.
Detroit 4, Michigan
Cook Heat Treating Co. of Texas
Houston 11, Texas
The Dayton Forging & Heat Treating Co.
Dayton 3, Ohio
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Reliable Metallurgical Service, Inc.
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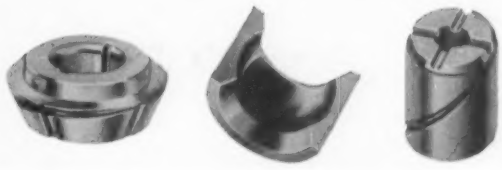
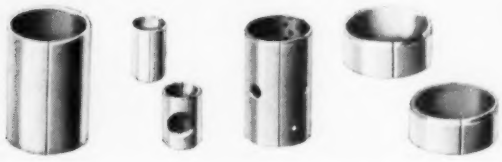
This advertisement sponsored by these Companies which are members of the Metal Treating Institute.

Sleeve bearings in a wide variety of designs and sizes

Cast bronze bushings



Precision bronze parts



Bi-metal split bushings

Rolled split bushings

Washers

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FEDERAL-MOGUL CORPORATION FEDERAL Mogul **11051 Shoemaker, DETROIT 13, MICH.**

Since **FEDERAL-MOGUL** *1889*

ROCKFORD *Hydraulic* SHAPERS

Rockford Openside Shapers provide numerous improvements in the production of small planing and large shaping work. Reciprocation of the work, instead of the tool, provides planer accuracy, eliminates overhang and reduces wear. Stroke lengths, feed and cutting speeds are quickly adjustable within the range of the machine.

A wide variety of sizes—36″, 48″, 60″ and 72″ stroke are available.

Investigate these shapers . . . as modern in machine tools as tomorrow's jets.
A Rockford Machine Tool Co. representative will give you complete information.

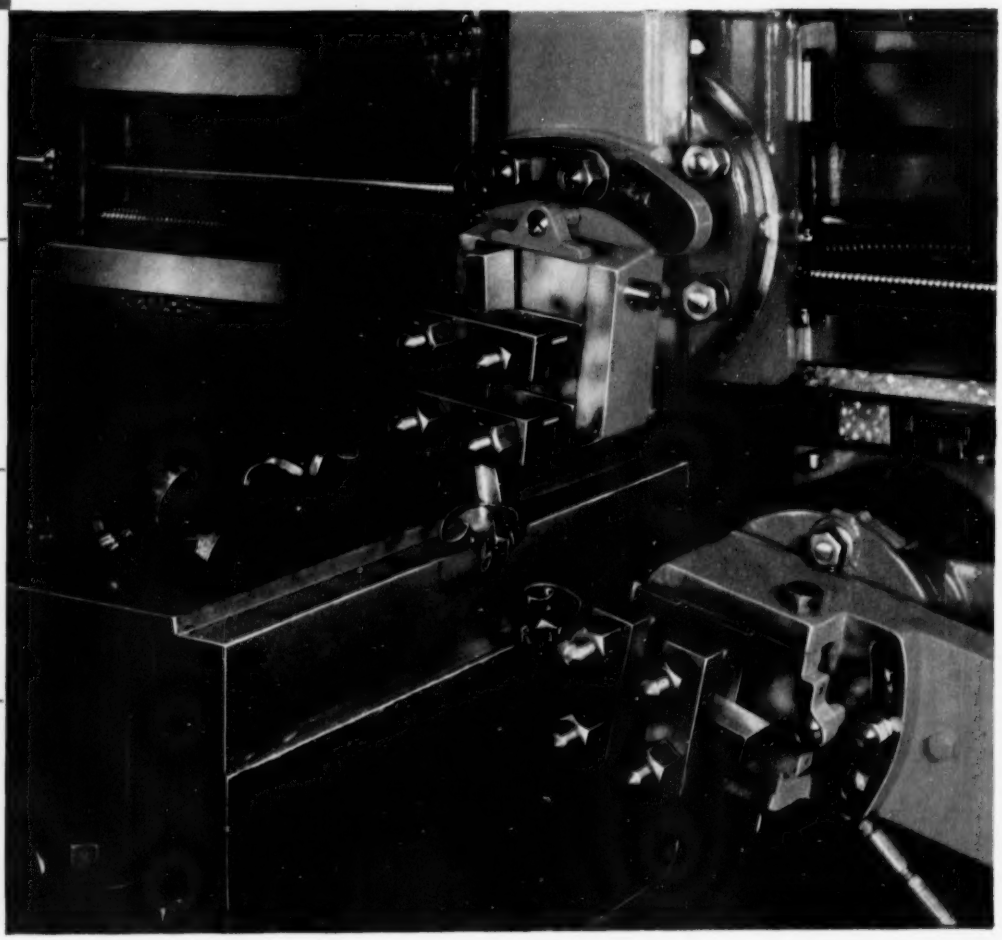
FEATURES:

Side Head

Hydraulic Tool Lifters (For Rail and Side Heads)

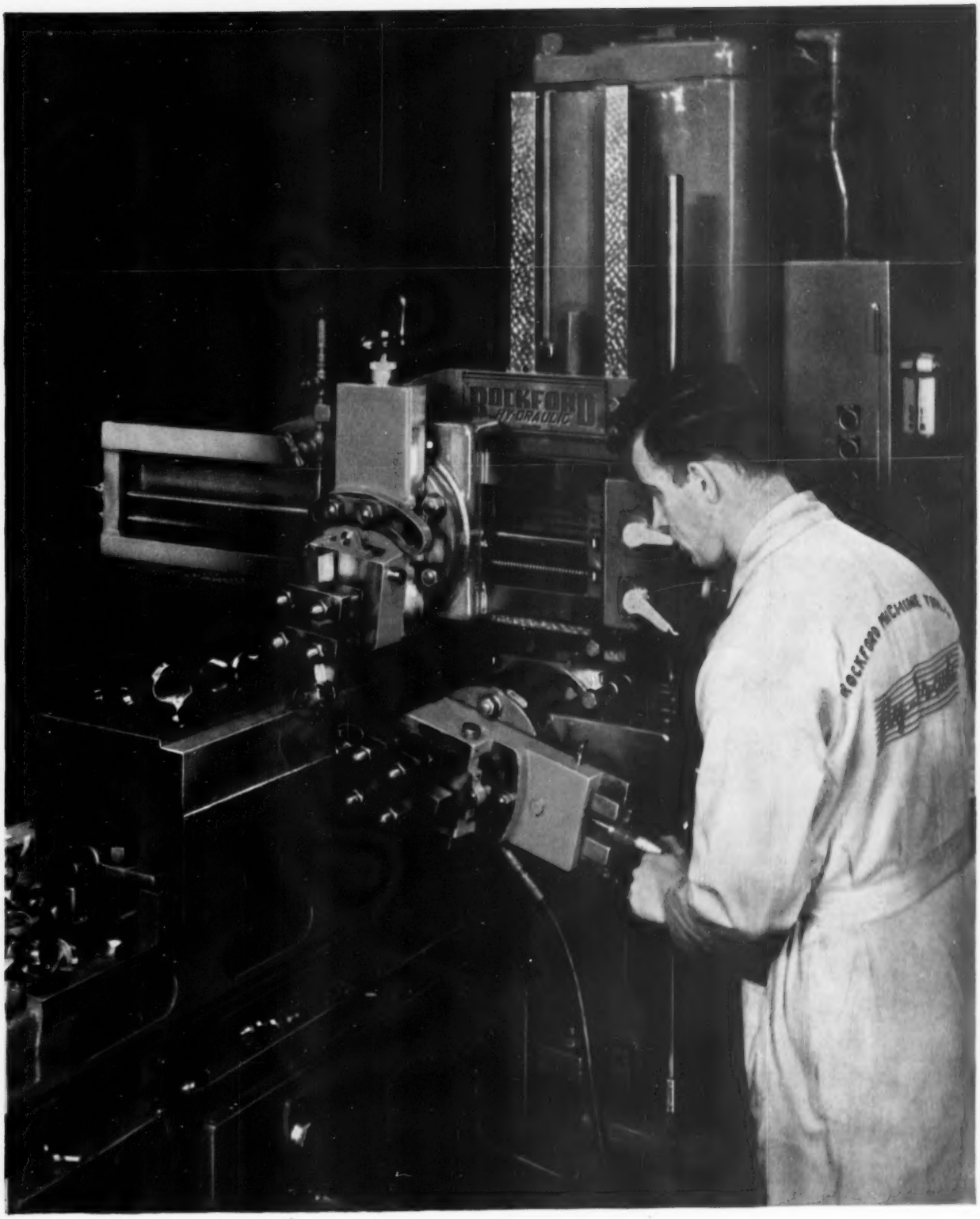
Power Rail Elevation

10 hp 1200 rpm
220/440 volt
3 phase 60 cycle
Open Ball Bearing
Motor and Control



shaping • planing • duplicating • turning

OUR 51st YEAR



Rockford Machine Tool Co. Rockford, Illinois

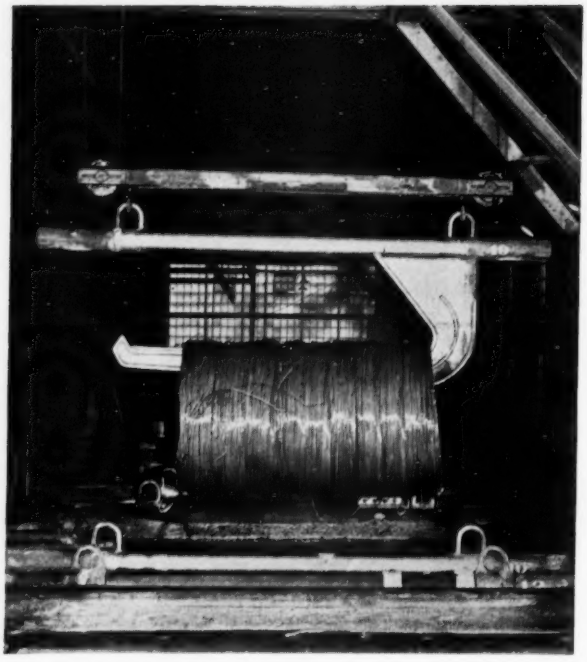
How

"Failed in 6 months"

was changed to

"Excellent condition after 5 years!"

...in one of the Nation's leading wire mills



This Weldco hook of Monel, emerging from a 12% sulphuric acid solution, is carrying a 5,000 lb. load of wire. It is one of many Monel hooks at the John A. Roebling's Sons Corp. The first hooks installed have already given over 5 years of service life. Other materials failed in as little as 6 months.

Back in 1948, some of the pickling hooks at John A. Roebling's Sons Corp. of Trenton, N. J., were giving a service life of only six months.

This, the engineers decided, was entirely too short.

They had heard excellent reports about Weldco hooks of Monel, manufactured by the Youngstown Welding and Engineering Company—reports that told of Monel hooks still in service after ten years.

So they began replacing their hooks with corrosion-resisting Monel.

The conditions were severe. The hooks had to go through a 12% sulphuric acid solution at a temperature of 170° to 180°F. carrying a load of 4200 to 5000 lbs. of coiled wire. Each hook had to handle about 60 tons of wire a day.

Six months passed—a year—five years—the first hooks were still in service. What's more they showed practically no signs of corrosion. But the spreader beams to which the hooks were welded had started to corrode from the fumes. Since the hooks were still in excellent condition they were returned to Youngstown for new spreader beams—this time of Monel pipe. They are now back at work giving the same dependable service.

Here's why Youngstown Welding and Engineering Company use Monel for their Weldco hooks:

- Long life because of Monel's resistance to corrosion from sulphuric acid solutions and fumes.
- Light weight for easy handling because of Monel's strength.
- Ready maintenance because of the fabricated construction and Monel's weldability.
- No breakage because of Monel's ductility.
- Extra heavy loads because of Monel's strength.

Tough corrosion-resisting Monel equipment can help increase the efficiency of your own pickling room. Monel crates, racks, chains, hooks, and accessories are used by many of the nation's leading plants to give increased payloads and longer service life. For more information on how Monel can help you, write for "Where Monel Pays Its Way in Pickling."

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

Inco Nickel Alloys

MONEL® • "R"® MONEL • "K"® MONEL
"KR"® MONEL • "S"® MONEL • INCONEL® • INCONEL "X"®
INCONEL "W"® • INCOLOY® • NIMONIC® ALLOYS • NICKEL
LOW CARBON NICKEL • DURANICKEL®

Monel... *for minimum maintenance*

STEEL

February 8, 1954

Metalworking Outlook

Business Decline? Just Transition

The administration's position concerning the current business decline: Keep calm; we're in a transition from a semiwar to a peacetime economy. The President's budget for fiscal 1955 assumes that unemployment and prices have reached their peak. Rep. Jesse P. Wolcott (Rep., Mich.), chairman of the Joint Congressional Committee on the Economic Report, says he is convinced that the assumption is sound that joblessness in the foreseeable future will not pass 2.5 million. It's about 2,360,000 now.

Prices: 1-Per-Cent Drop Likely

A STEEL survey of 5000 metalworking companies reveals that the average price change expected in 1954 is a 1-per-cent decrease. New model auto prices are generally up slightly, but quotations on accessories are generally down from last year (p. 82). On many consumer items, discounting and "deals" bring the actual cost to the buyer to below the list price. Watch for more of this as the year progresses.

More Pressure for GAW

The United Steelworkers of America-CIO is building up more pressure behind its drive for the guaranteed annual wage. Spurred by the fact that an estimated 120,000 of its members are idle, the union's leaders are taking a new look at GAW. Only three months ago some of the officials intimated that they expected no showdown on the issue in 1954, but would use this year's negotiations as a softening-up period for an all-out drive in 1955. USA's official paper, *Steel Labor*, hints that all stops will be pulled to win GAW this year.

Sign of the Times

Protests against the purchase of out-of-state steel, while Washington state steel mill workers are drawing unemployment compensation, have been filed by officers of union locals representing employees of Bethlehem Pacific Coast Steel Corp.'s Seattle rolling mills and fabricating plant and of Northwest Steel Rolling Mills Inc. Particular reference is made to 1200 tons of reinforcing steel involved in a Seattle bridge which was awarded to a California firm. Bethlehem's local plant rolled about 200 tons of the job, according to union officials, because the California plant could not supply the initial order in time.

Measuring Your Growth

How big will your company be by 1960 or 1975? Eddy-Rucker-Nickels Co., a management consultant firm in Cambridge, Mass., has worked out ways to answer that question. If your company has an average growth—keeps pace with population and productivity gains—multiply your current net assets by 237 per cent to get the value you should have by 1975. For an idea

The Technical Outlook—p. 107 The Market Outlook—p. 169

of your employment by 1960, multiply the number of today's workers by 109.1 per cent. Use the multiplier, 131.4 per cent, to estimate 1975 labor needs.

The Right of Appeal

Look for some relief from the government contract situation resulting from the Supreme Court decision in the Wunderlich case. In that decision the court ruled that when a contractor accepts a contract providing that the decision of a government department head on questions of fact is final, the contractor has no right of appeal. Hearings on legislation to give contractors the right of appeal from findings of fact have been concluded by the House Judiciary Committee which now is preparing a report.

A Private Stake

The aircraft industry has much more of a financial stake in its current expansion than it did during World War II. More than 34 per cent of its facilities has been privately financed since the beginning of the Korean war, compared to less than 11 per cent from 1940 to 1945. Since 1950, floor space has more than doubled—from 63.5 million square feet to 135.8 million square feet. Since 1950, military aircraft production has quadrupled—from 3000 in 1950 to 12,000 in 1953.

Aid for Miners?

Watch for the President's Minerals Policy Committee to come up with recommendations for some sort of subsidies to keep our domestic mining industry healthy. The reasoning will be that we need a strong mining industry in case a war cuts us off from foreign supplies.

Straws in the Wind

Thompson Products Co., Cleveland, has put to work a device built by Hautau Engineering Co., Detroit, that machines jet engine stator housings in less than 10 minutes; one man now does a job that conventionally takes five men 2½ hours to accomplish. . . Grinding wheel sales in the U. S. were $160 million last year, estimates Electro Refractories & Abrasives Corp.'s K. S. Cowlin. . . National Steel Corp.'s 1953 earnings, before a special charge arising from a property sale, hit $50.3 million. . . Cash dividend payment by corporations issuing public reports amounted to $1715 million in December, 1 per cent less than the $1736 million paid out in December, 1952.

This Week in Metalworking

Industrialists are tightening up on the credit they give, but the situation is not yet serious (p. 67). . . Three titanium producers seek civilian customers because supplies are temporarily in excess of demand (p. 69). . . Nonferrous foundrymen expect an order upturn (p. 70). . . The Maritime Administration is preparing a three-part plan it hopes will answer the shipbuilders' S O S for more business (p. 72). . . Elgin National Watch Co. is planning its own metamorphosis (p. 77). . . For the companies that have the nation's 124.3-million-ton steel ingot capacity, see pp. 78-79.

How Stainless Steel Stampings Save Money Here

Cast pilot rings (at top) for an oil-fired circulating heater warped and disintegrated—sometimes after only a few months' service. The rings wouldn't stand up at cherry-red heat, and replacements were expensive.

To increase service life of the pilot ring and reduce costly maintenance, the manufacturer replaced the castings with the stamped assembly shown below. This unit is made of 16-gage Armco 17, Type 430, stainless steel strip and ¼-inch diameter Armco 17 spacer rods. The new parts weigh about one-third as much as the castings.

Hundreds of stainless steel applications in high temperature jobs show that the manufacturer can expect to save far more in replacement expense than the additional cost of the stainless steel. Moreover, he will have a new quality sales point.

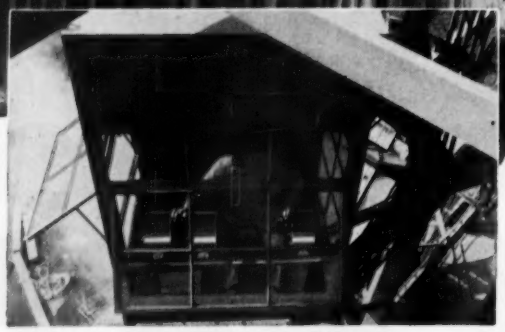
STAINLESS STEELS TO SUIT CONDITIONS

Armco 17 does well in most fiery jobs—withstands temperatures up to 1550 degrees F without destructive scaling. Yet there are numerous other stainless grades for more severe service than in this oil burner. Certain grades will resist temperatures up to 2000 degrees F. Others have especially high tensile and creep strengths at elevated temperatures. For information on how to select a stainless steel for high temperature service write for the booklet, "Armco Stainless Steels for Heat Resistance."

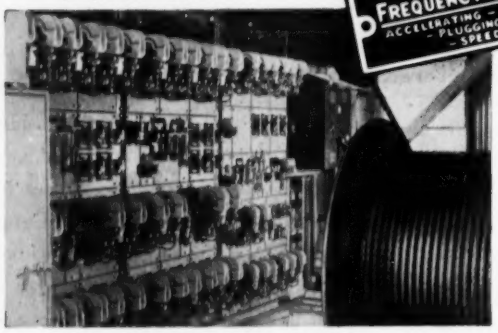
ARMCO STEEL CORPORATION

4793 CURTIS STREET • EXPORT: THE ARMCO INTERNATIONAL CORPORATION

Fast Lifts–Safe Lifts WITH EC&M CONTROL easy to operate, TOO



Narrow-width EC&M Cam Master Switches are closely grouped for operator's convenience on this 720 ton-per-hour Barge Unloader, designed, fabricated and erected by Heyl & Patterson for the Duquesne Slag Company, Pittsburgh, Pa.



EC&M LINE-ARC Contactor Controllers for Closing & Holding Line Motors and for the Trolley Motion are EC&M Frequency Relay Controlled for fast, safe operation.

Output increases and costs go down when operators find rhythmic response at their finger-tips. Paying out cable to dig into the pile, taking the swing out of a loaded bucket at the point of discharge, and keeping the bucket open when lowering for another load are time-savers on bulk material-handling applications.

On river unloading stations, at lake and ocean ports, EC&M Control has a reputation among operating management for fast handling because bucket manipulation, trolley travel and similar operations respond quickly to the operator's needs. Straight-line, lever-operated EC&M Cam Master Switches have a short throw in both directions—are less tiring on the operator—the off-point is distinct and easy to find when returning from any of the speed-points. Put your control applications up to EC&M.

It pays to specify **EC&M Control—control engineered for high output with safety.**

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"Wolf" Cry from the Left

President Eisenhower's economic message was given an unusually generous reception in most quarters. One reason for this is that his conclusions seemed to be derived from an honest, objective study of economic conditions as they really are. This objectivity is in gratifying contrast to the wishful thinking of some economic advisers in previous administrations who were quite willing to shade a fundamental economic principle in order to bolster a favorite political objective.

The President expressed his belief that the present adjustment in the nation's economy can be accomplished without severe repercussions, but at the same time he promised that if this appraisal of the situation proves to be wrong and if the adjustment imposes hardships that are too severe, the government will be prompt to introduce remedial measures.

This is a forthright statement that will satisfy a great majority of the American people. However, there are some who look at the present figures on unemployment and either charge that they fail to show the true extent of unemployment or complain that the hardships already are severe enough to justify drastic action for relief on the part of the federal government.

It is significant that most of this clamor comes from the elements of the nation's left wing, including some New Dealers and Fair Dealers, members of Americans for Democratic Action and some extremists among CIO leadership.

It has remained for Leonard W. Hall, chairman of the Republican National Committee, to expose the real character of this present "wolf, wolf!" attitude of the left-wingers. At a Lincoln Day meeting in Providence on Jan. 28 he pointed out that these persons look at today's count of 2 million or more unemployed and cry to high heaven, whereas in 1948 when unemployment also stood at 2 million, "Mr. Truman and Mr. Reuther called that figure prosperity."

Unemployment reached 3,400,000 in 1949 and 4,700,000 early in 1950, yet the left-wingers did not criticize the Truman administration or indulge in talk of recession or depression.

It is quite evident that much of the extreme alarmist talk about our economic situation stems from political motives.

E. L. Shaner

EDITOR-IN-CHIEF

UNORTHODOX APPROACH: If your company were threatened by competition which seemed to make it desirable to broaden its base, how would you go about finding new products?

Doubtless there are several sound approaches,

but the Elgin National Watch Co. (p. 77) chose one that is unorthodox. Instead of calling in outside experts, it simply made known at a press conference that it was in the market for new enterprises that would help to broaden the scope of its operations.

Elgin—helped by a business-consultant firm—made it known that it had three basic assets—quality, miniaturization and precision. In due time it became apparent that the fields of promising potential for Elgin are miniature electronics and precision production instruments.

From that press conference 382 lead source contacts have been developed, and 54 companies with affiliation possibilities have been discovered.

* * *

EXPEDITING BY RADIO: This week the cover story deals with the advantages of radio communication systems for controlling the movement of materials handling equipment in and around industrial plants. Companies desiring to install a system of this kind must obtain a license to use radio from the Federal Communications Commission. However, this is not difficult and usually a license can be obtained in 60 days.

The first intraplant transmitting license was granted by FCC in 1949. By November of last year 127 American producing, fabricating and manufacturing establishments (p. 108) had obtained licenses, and today there is abundant evidence to show that radio communication between the operators of materials handling vehicles and a central dispatcher usually results in substantial reductions in cost. One enthusiast goes as far as to say he would use radio dispatching if he had only one truck in his plant.

* * *

ONE EVERY 17 MONTHS: Recently Benjamin F. Fairless, chairman of United States Steel Corp., addressed the 117th annual meeting of the Delaware State Chamber of Commerce at Wilmington. At the conclusion of his exceptionally well received remarks (p. 78) he made this significant statement:

"Within the next 20 years, we are told, we will have 45 million more people to feed, house and clothe. . . . Last year we completed our new Fairless Works upriver on the Delaware. That is the largest single steel plant that has ever been built at one time. But if the per capita consumption of steel remains what it is today—and even if it does not rise, as it always has throughout this century—it will still take 14 more plants of that size to meet the demands of these 45 million new people. That means a new Fairless Works every 17 months for the next 20 years!"

And think what will be required in new fabricating and manufacturing facilities to match this increase in primary production!

* * *

USE OF POWER VARIES: At a recent meeting sponsored by the Ohio Chamber of Commerce, Philip Sporn, president of the American Gas & Electric Co., presented signicant comparisons on electric power consumption. From 1940 to 1952, electric power output increased 106 per cent in Canada, 114 per cent in France, 117 per cent in the United Kingdom, 150 per cent in Soviet Russia and 180 per cent in the United States.

In 1952, average per capita consumption of electric power in the United States was 2200 kilowatt-hours. For certain selected industrial states it was 1500 kilowatt-hours in Massachusetts, 2100 in New York, 2200 in Illinois, 2300 in Michigan and Indiana and 2900 in Ohio. Here is a rather marked difference in consumption in nearby and somewhat similar states, and it would be interesting to know what factors are chiefly responsible for it.

* * *

A NEW LOOK AT FIRES: Recent serious industrial fires have caused executives, safety experts, insurance companies, fire equipment manufacturers and other interested individuals to take a new look at the fire problem and current methods of combating it.

Perhaps the thinking of many experts is reflected in the statement by Prof. John Ahern, director of fire protection and safety engineering at Illinois Institute of Technology, to an editor of this publication when he said (p. 112), "It's time to look at how we have been doing things with an eye to taking advantage of advanced technology wherever we can. In the use of flammable liquids, for example, we should substitute noninflammables where we can. A hydraulic line under 2000 or 3000 psi can be a dangerous flame thrower if it breaks and the oil catches fire."

If management will realize that new methods and practices constantly are introducing new hazards and will act promptly to guard against them, the fire loss of American industry can be lowered appreciably.

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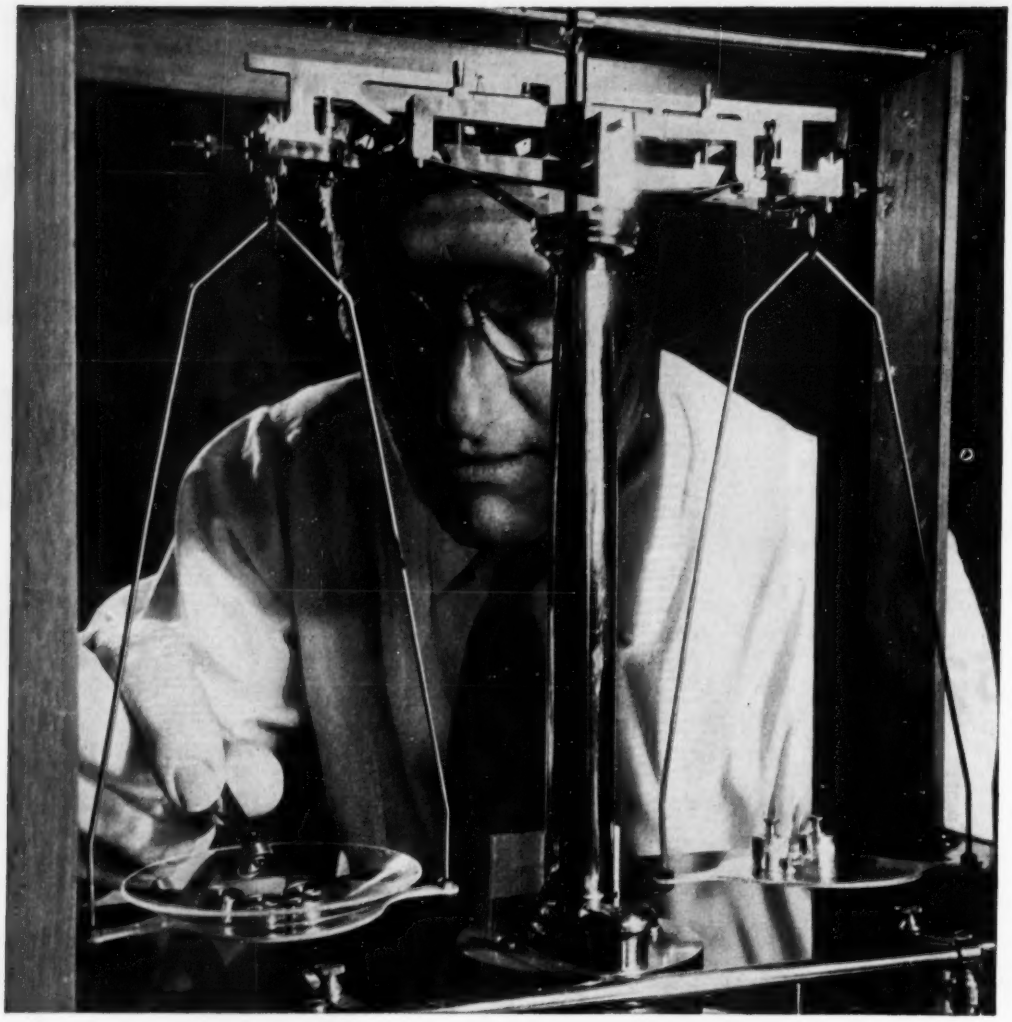

How much grease will a bearing keep?

IT ALL DEPENDS upon the application, of course, but grease-retaining properties can be extremely important in the operation of ball bearings. Automobile clutch bearings, for example, must not throw grease: if they did, grease would get on the clutch, causing it to slip and chatter.

Federal technicians weigh the specified Federal Ball Bearing, run it under actual operating conditions, then re-weigh the bearing on a precision balance to determine the amount of grease lost. In the case of automobile clutch bearings, grease loss cannot exceed *four grams!*

Of course, this is only one of the many tests used to prove Federal Ball Bearings—and only one of the many reasons you can be sure of top-notch performance from *every* Federal Ball Bearing.

The Federal Bearings Co., Inc., Poughkeepsie, N. Y.

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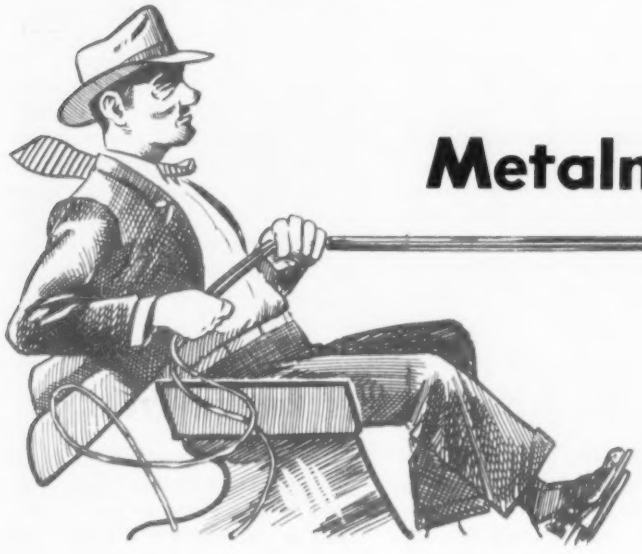


Metalmen Rein In on CREDIT

CAUTION, but not overcaution. That's the credit picture among steel and metalworking companies and distributors who are screening accounts more closely today and following-up collections more diligently.

Shift from a sellers' to a buyers' market has created the situation, but the Credit Commission of the American Bankers Association gives this warning: While repossessions have been more noticeable and collections have been getting tougher, the situation is not serious. ". . . . an overcautious approach to credit at this time represents a great danger to our economy."

Sales-Inventory Ratio—Edwin B. Moran, secretary, National Association of Credit Men, New York, is not too disturbed about the outlook. He believes that business in 1954 "will average out about as well as 1953, recognizing some nominal adjustments." However, he urges credit managers to give particular attention to the trend of their customers' sales in relation to inventories. "The real time to worry," he said, "is when sales and orders are declining and inventories continue to rise. That would mean that merchandise is backing up in the warehouses; it could make real trouble."

A large steel producer says: "There is without doubt some lag in accounts receivable, but it is far from being a serious situation. Some firms were undoubtedly caught without being able to pull in their horns fast enough. Here and there people are howling about inventory and asking for a little extra time."

Boston Figures—In New England, most metalworking companies who have been making a policy of discounting their bills continue to do so. Over-all figures recently reported for November in the Boston area show a gain of more than two percentage points from last August for manufacturers discounting their bills or paying when due, three points for wholesalers. Currently collections are a shade more difficult.

Pittsburgh credit men say there are no bankruptcies or much of a lag in payments among heavy industries, although there is an increasing number of bankruptcies among small fabricators. No single industry, except coal, is having industry-wide difficulty. Dudley R. Meredith, deputy secretary, Credit Association of Western Pennsylvania, reports for November that about 2.5 per cent more manufacturers were discounting or meeting bills when due than in August; among the wholesalers and distributors, the number was down 2½ per cent.

Broken Shoe Strings—In Cleve-

STATUS QUO IN ACCOUNTS RECEIVABLE

But Economic Shifts Bring More Caution on Credit

	% Discounting or Paying When Due			% Accounts Past Due		
	Nov. 1953	Aug. 1953	Nov. 1952	Nov. 1953	Aug. 1953	Nov. 1952
Metals, Iron & Steel, Brass, Alloys, Copper						
Manufacturing, Industrial Accounts	86.4	85.5	84.9	13.6	14.5	15.1
Wholesale, Distributor, Jobber Accounts	83.6	86.6	88.2	16.4	13.4	11.8
Industrial Machinery & Equipment						
Manufacturing, Industrial Accounts	86.1	87.9	84.3	13.9	12.1	15.7
Wholesale, Distributor, Jobber Accounts	86.3	88.3	87.5	13.7	11.7	12.5
Electrical Equipment & Supplies						
Manufacturing, Industrial Accounts	86.7	81.8	87.7	13.3	18.2	12.3
Wholesale, Distributor, Jobber Accounts	86.4	76.4	83.9	13.6	23.6	16.1

Source: Survey of 27 cities by Credit Research Foundation Inc., New York.

land, Ralph H. Coleman, executive secretary, Association of Credit Men, says that reduced volume has caused some washouts of those who started business with inadequate capital or experience. Particularly hard hit are small machine shops which started on war contracts and were unable to weather the storm when contracts were completed or dropped.

C. E. Philip, assistant treasurer, Consolidated Iron-Steel Mfg. Co., Cleveland distributor, says: "The weak sisters are getting weaker, and we're watching them much more closely. Credit tightening has not affected more than 10 per cent of our customers thus far. Past due list is not much worse than a few months ago, but that is due a great deal to our nudging." He expects little trouble in 1954.

Both Ends—With business competition keener, Philadelphia credit managers are not only watching their customers, but the activities of their own companies as well—especially as they reach out for new customers. One steel producer says that mutually satisfactory credit relations have been set up in about 99 per cent of the new cases to arise. "Our credit department is tough and definitely not committed to giving steel away; at the same time it's not disposed to throw up unnecessary road blocks to our efforts to line up new customers."

A leading iron and steel distributor in that city expects business this year to be good, but not up to 1953 and "is waching credit a little closer." Discounting by customers is stable; as of Dec. 31, 80 per cent of accounts were current. Only twice before in 1953 had that level been reached—in February and September.

Cutomers' Tactics—Primary sellers of steel and other metals in New York are especially interested in customers' plans and procedure for meeting the keener competition which now prevails. What are their price policies and are they disposed to trim their prices too closely? What are they doing toward the installation of newer and more efficient production equipment and can they finance it? Are they disposed, in their desire to get business, to go after jobs beyond their normal depth.

A New York steel distributor finds collections better after a lag of almost three months. He's encouraged, but wary.

A large industrial firm in Chicago says delinquencies are confined to fringe accounts, representing 15-20 per cent of its business. On the West Coast "it's a return to normal without serious repercussions or implications." The word from Detroit is that the general credit situation is still favorable, although a bit spotty in the retail category.

The last nation-wide roundup of Credit Research Foundation Inc., affiliated with the National Association of Credit Men, reported: Manufacturing accounts were less prompt in November compared with August, but only to a slight degree. Retail and wholesale accounts, on the other hand, were paying their trade invoices more promptly. One member of the foundation staff believes that there has been no important change in the general picture since November.

New Hurdles in Manufacturers' Race for Profits

METALWORKING manufacturers as a whole enjoyed a prosperous dollar sales year in 1953. However, many manufacturing firms, like Air Reduction Co. Inc., saw sales increase while income after taxes decreased.

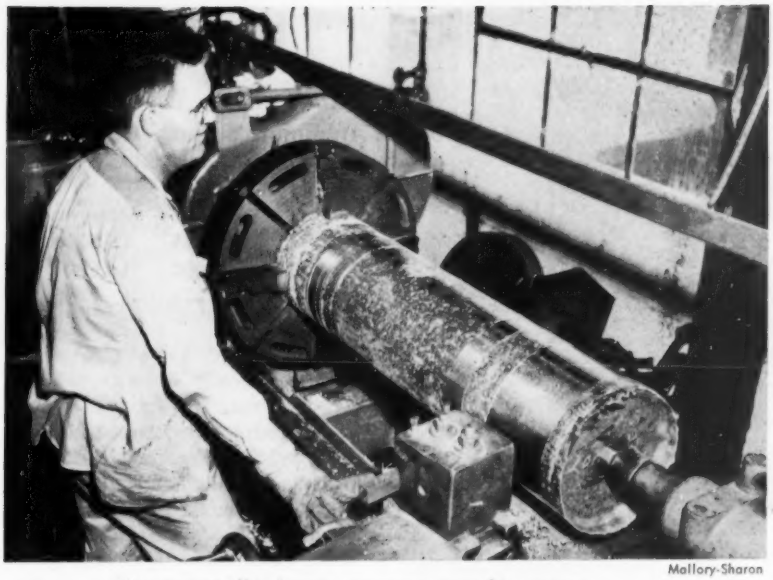
In Air Reduction's case, sales in 1953 amounted to $131,412,104 compared with 1952 sales of $124,625,163. For what happened to Air Reduction's net income, see the table of selected manufacturers' net income reports below.

Higher Hurdles—Added to the old nemesis of excess profits tax, other factors began to put a heavy hand on industry's net income during the latter part of 1953. Among them — increased costs such as wages not entirely passed on in increased prices, combined in some cases with slightly lower volume of production; cutbacks and rescheduling of national defense production; and added expenses such as outlays for improving machinery and product research.

Manufacturers' Net Income After Taxes

	For Year Ended	1953	1952
Aeroquip Corp.	Sept. 30	$ 1,080,471	$ 923,492
Air Reduction Co. Inc.	Dec. 31	6,766,356	7,289,694
American Can Co.	Dec. 31	30,778,414	27,380,494
Avco Mfg. Corp.	Nov. 30	3,368,598	11,028,927
Bendix Aviation Corp.	Sept. 30	17,352,710	15,295,159
BIF Industries Inc.	Nov. 30	252,426	240,651
Carrier Corp.	Oct. 31	6,107,134	4,522,512
Caterpillar Tractor Co.	Dec. 31	20,254,514	22,118,060
Cherry-Burrell Corp.	Oct. 31	663,550	633,185
Continental Motors Corp.	Oct. 31	6,023,812	6,126,021
Deere & Co.	Oct. 31	24,737,531	35,164,989
Divco Corp.	Dec. 31	509,116	387,343
Dresser Industries Inc.	Oct. 31	5,124,310	5,766,596
Eastern Industries Inc.	Sept. 30	297,703	162,864
Emerson Radio & Phonograph Corp.	Oct. 31	2,988,432	2,262,556
Foote Bros. Gear & Machine Corp.	Oct. 31	640,866	682,828
Grumman Aircraft Engineering Corp.	Dec. 31	7,129,341	5,348,900
Hayes Mfg. Corp.	Sept. 30	666,530	663,035
International Harvester Co.	Oct. 31	52,029,417	55,656,188
Koppers Co. Inc.	Dec. 31	9,025,981	8,612,822
Lamson & Sessions Co.	Dec. 31	1,500,025	1,293,767
Lakey Foundry & Machine Co.	Oct. 31	433,939	744,456
Michigan Steel Tube Products Co.	Sept. 30	515,213	60,665
Minneapolis-Moline Co.	Oct. 31	2,103,613	4,452,284
Mullins Mfg. Corp.	Dec. 31	3,330,183	3,595,549
Murray Corp. of America	Aug. 31	4,054,499	4,032,127
National-Standard Co.	Sept. 30	1,728,438	1,641,292
Oliver Corp.	Oct. 31	2,809,517	6,029,257
Piper Aircraft Corp.	Sept. 30	321,611*	395,062
Standard Forgings Corp.	Dec. 31	880,437	826,990
Union Carbide & Carbon Corp.	Dec. 31	102,783,442	98,320,699
United Drill & Tool Corp.	Dec. 31	1,507,000	1,853,123
Vogt Mfg. Corp.	Dec. 31	364,734	274,207
York Corp.	Dec. 31	3,006,533	2,452,470

* Excludes special credit of $74,344.



Mallory-Sharon

Unexpectedly large sponge supply means . . .

Titanium: Plenty in Midst of Scarcity

Three producers seek civilian customers as supplies of finished products temporarily exceed demand. The condition may last six months

JOCKEYING between supply and demand has resulted in this curious paradox in titanium:

Though the long-range outlook for titanium is one of continuing scarcity, Rem-Cru Titanium Inc., Midland, Pa., Mallory-Sharon Titanium Corp., Niles, O., and Republic Steel Corp., Cleveland, find that they have more capacity available for finished titanium products than they have orders for the first half of 1954.

Bargain Shopping—Thus, while General Services Administration busily arranges for more capacity to turn out titanium sponge and a Senate subcommittee investigates shortages, three producers seek customers for some of their production which is temporarily in excess of demand. There's no fault involved in the situation.

It happened like this: The overall titanium production program, though growing by leaps and bounds, was generally well below target levels (see STEEL, Jan. 18, p. 41). So defense buyers, primarily in the aircraft industry, were not geared for any spurt in supply. Then, E. I. du Pont de Nemours & Co., which supplies the sponge to Rem-Cru, Mallory-Sharon and Republic, brought in new sponge-producing capacity well ahead of schedule. It boosted its potential from 2.5 to 10 tons per day. Producers are able to take advantage of the added sponge with added output of finished titanium. But defense buyers are not—yet.

Unexpected—So, until defense purchasers catch up with the situation, you can buy more titanium for civilian uses. For prices, see p.171.

Titanium Metals Corp., New York, the fourth producer in the U. S. of the finished metal, reports that it is booked up on its capacity, which is also rising. TMC is the only one of the finished titanium makers that produces its own sponge.

Nondefense Customers — Civilian orders for the temporarily excess titanium may come from such fields as the marine industry, since titanium is impervious to salt water. Or they may come from the chemical industry where titanium is good in applications using all types of oxidizing and chloride solutions. Rem-Cru would like to see these nondefense sources get more titanium since any titanium capacity now diverted to civilian channels could be used as a buffer in case of all-out war when defense demand for titanium would jump considerably.

Chances are, though, military buyers will take no longer than six months to boost their demands up to present supply levels. The Air Force has already written letters to all its contractors telling them that there is titanium available for immediate use.

More Coming—Hard on the heels of its latest expansion, Du Pont concluded agreements with the government to design a new titanium plant with capacity of 7000 to 8000 tons of titanium sponge a year. Du Pont will design and make engineering studies at a cost of about $600,000 and may go on to construct the projected $30-million to $35-million plant, probably in Tennessee (See p. 172.)

At the same time, the Union Pacific Railroad announces it has found large deposits of titanium-rich iron ore in southeastern Wyoming. Deposits of 228 million tons of iron ore, averaging 19 per cent titanium content have been found in an area of some 250 square miles near Laramie, Wyo.

In Toto—Put it all together and there's another big spurt in titanium output looming up ahead. The GSA is trying hard to come close to the 22,000-ton goal scheduled for 1955.

New Titanium Fabricator?

Curtiss-Wright Corp. wants to take titanium sponge and melt, alloy and extrude it for parts in its aircraft propeller and engine production, says Roy T. Hurley company president. Air Force blessing has been asked since the plan involves using one of the Air Force's heavy presses at Buffalo and putting finished titanium parts in military engines.

Mr. Hurley predicted output might grow to 500 tons a month within 2½ years if the plan works out. Curtiss-Wright would not be a primary titanium sponge producer under this plan. It would take the sponge and continue the processing from there.

Output: Aluminum Scores a Gain

Figures in Net Tons, Excluding Die Castings

	Aluminum	Copper & Copper Alloys	Magnesium
1952	174,673	500,825	15,000
1953*	208,000	466,000	14,600

* Estimate based on Bureau of Census 11-month totals.

Nonferrous Castings: Upturn Awaited

Defense cutbacks and drop in civilian orders in final quarter of 1953 have forced some foundries to drop to three-day operations

REFLECTING the strides made in other applications, aluminum paced the nonferrous castings industry in 1953 with a 20 per cent increase in output over 1952. Magnesium castings production maintained its 1952 level last year (see table), but copper and copper-alloy castings recorded a 7 per cent decline.

Defense orders continued at a high-level rate throughout the year, but civilian goods orders slackened in the fourth quarter, clouding the outlook for 1954. Output estimates for this year vary, but the consensus is that copper and copper-alloyed castings will decline 5 to 10 per cent, aluminum 10 per cent and magnesium even more sharply.

Defense Question — With many nonferrous foundries operating three and four days, the industry is eying closely the government's plans for defense. Order stretchouts and some cancellations are already being felt. The magnesium industry is feeling the pinch in the defense emphasis on jet rather than reciprocating engine aircraft—jet engines require less magnesium castings.

Officials at the recent Magnesium Association meeting urged members to attack the defense cutback problem with more aggressive promotion to maintain the emergency - built consumption gains. Sand castings, permanent mold castings and die castings of magnesium are getting more competitive price-wise with aluminum.

Bright Spots—All's not gloomy on the nonferrous castings front, however. A slight upturn in order volume has been noted recently. Founders are also optimistic that prices of secondary metals may settle further so that nonferrous castings costs can drop.

Unemployment Rises Slowly

Employment surveys of the Labor department for January, 1954, show that nine-tenths of the 149 major labor market areas in the U. S. experienced employment declines from November. Resultant increases in unemployment were held to moderate proportions, however. Only 18 areas changed in the Labor department classification of labor supply.

Fifteen of the 18 areas shifted their classification from Group II (balanced labor supply) to Group III (moderate labor surplus). These were: Detroit, St. Louis and Kansas City, Mo., Trenton, N. J., Minneapolis-St. Paul, Battle Creek, Mich., Canton, O., Ft. Wayne, Ind., Joliet, Ill., Louisville, Binghamton, N. Y., Oklahoma City, Okla., Perth Amboy, N. J., Sacramento, Calif., and Wilmington, Del.

One area, Saginaw, Mich., moved from Group I (labor shortage) to Group II.

Two areas—New Bedford, Mass., and Muskegon, Mich., shifted from Group III to Group IV (substantial labor surplus).

In addition, 31 smaller areas were placed in Group IV, seven more than in November. Smaller areas are classified only when they have serious unemployment problems.

Bethlehem Raises Pension Ante

Bethlehem Steel Co. has agreed in negotiations with the United Steelworkers-CIO to turn over an additional $2.5 million to the joint company-union pension and insurance fund.

Amount is over and above the 2.5-cent hourly contributions made by both the company and the employees for the insurance program. Pensions are supported by only company contributions and federal social security.

Power Plant Equipment Tight

If you are planning an electric power plant expansion to be placed in service late in 1955 or 1956, it would be a good idea to order the turbogenerators, boilers, condensers and allied equipment now. According to recent statistical studies conducted by the Power Equipment Division of Business & Defense Services Adminis-

tration, units larger than 40,000 kilowatts capacity will not be available until that time.

Some industry reports indicate the deadline for large, new design units for shipment early in 1956 already may have been passed. However, there is still some open capacity in late 1954 for units of less than 40,000 kilowatts.

SEC Simplifies Reporting

Aimed at saving time and money, the Securities & Exchange Commission has revised and simplified reporting requirements for thousands of companies reporting to it.

Revised forms eliminate duplication of information in different reports. Thus, over half the items in a company's annual report may be omitted by firms filing proxy statements with the SEC which contain similar information. Revised forms also encourage firms to publish comprehensive annual reports to stockholders, says the SEC. That's because such reports filed with the SEC furnish information which can then be omitted from other SEC forms.

National Gets Fast Write-Off

National Steel Corp. has been granted a certificate of necessity providing a fast write-off of 25 per cent on the $77,305,000 renovation of its Weirton Steel Co. division electrolytic tin plate mill at Weirton, W. Va.

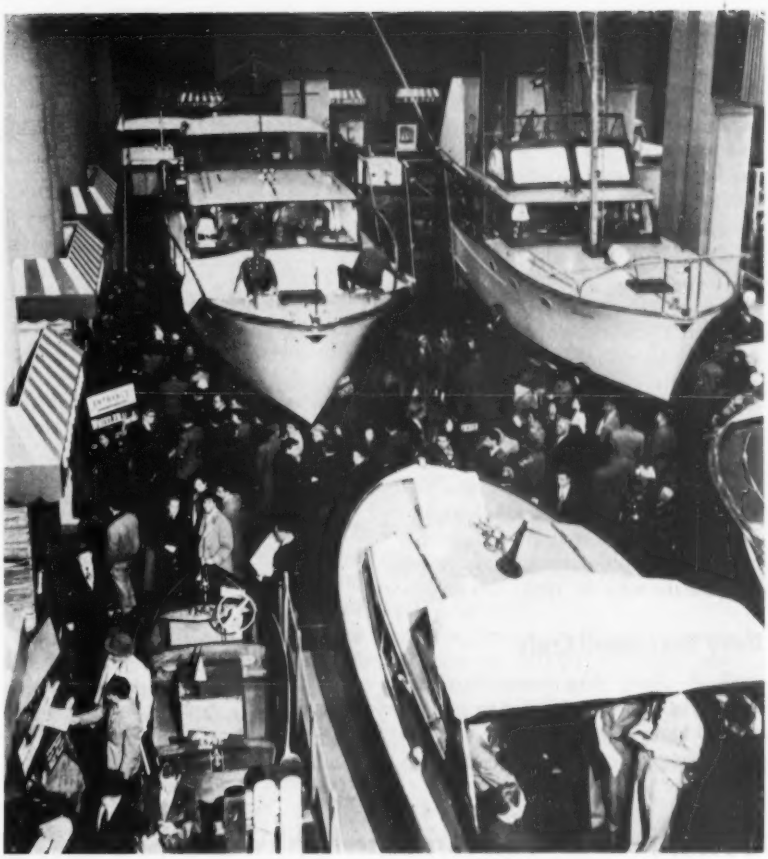
The award was the largest of 58 issued for new or expanded facilities by the Office of Defense Mobilization in the two-week period ended Jan. 13. Certificates are for projects costing $118,487,751.

New England's Metal-Users Gain

Metal-using industries in New England upped their employment last year to 655,000 persons, 29,000 more than in 1952.

Scoring the greatest gains were transportation equipment manufacturers, whose payrolls rose to 101,500, an increase of 12,000 workers over 1952, and electrical machinerymakers, who employed 136,800 people, 10,000 more than the preceding year.

The 5000 additional fabricated metalworkers also helped.



Boat Builders Ride Rising Tide

Crowds at this year's National Motor Boat Show bolster boat and engine manufacturers' predictions of a 30-per-cent increase in sales for 1954

THE BOATING INDUSTRY expects no trouble in bettering its 1953 sales in 1954.

John W. Mulford, president of the National Association of Engine & Boat Manufacturers, says an industry survey shows boat sales increased 32 per cent last year and another 30 per cent increase is in the offing for 1954. Eighteen boat builders report dollar sales totaling $8,737,737 in 1953.

Put-Puts Up—Outboard motormakers look for increased sales in 1954, too. A 30 per cent rise in dollar sales will follow the 500,000-unit output projected for 1954. That compares with less than 450,000 units in 1953, 320,000 units in 1952.

Last but not least, marine hardware and equipment producers reckon their industry-wide increase at about 12 per cent in 1953 over 1952. A further hike in dollar sales is expected this year.

Riding the Wave—Manufacturers cite increased materials availability for the strong sales showing in 1953. Boat dealers are still on allocation though; the public wants more boats for fishing and fun than the industry is able to provide.

Steel, both welded and riveted, is used for hulls of cruisers from 23 feet to 60 feet in length. Aluminum goes into numerous runabouts, dinghies and canoes. Considerable aluminum also finds its way into outboard motors. With the easing of aluminum supplies, boat builders saw their materials shortages evaporate except for certain types of wood used in boat construction.

Polyesters Under Sail—Use of

plastics has become an established practice in boat building, in addition to wood, steel and aluminum. It's estimated that 10 to 15 per cent of all small craft bottoms (boat bodies to the layman) are made of laminates of glass cloth and polyester resins. Plastics are creeping into the larger-sized craft, in sail boats up to 24 feet in length and fishing cruisers up to 26½ feet in length.

Manufacturers in the boat industry had much to chortle about over their bottle of rum at the Golden Jubilee National Motor Boat Show in New York last month. Sales were at their crest in the 50-year history of the industry. And the crowds swarming around latest models at the boat show indicated a new crest was on its way in 1954.

Navy Buys Small Craft

U. S. Navy has contracted for 94 utility boats of 50 feet in length to cost about $2 million.

Roberts Industries will construct 53 boats for delivery to various East Coast points at a unit price of $21,498.79. Remainder will be built by Blanchard Boat Co. at a unit price of $22,483.86 for delivery to West Coast points.

Newport Gets Supercarrier

Newport News Shipbuilding & Drydock Co., Newport News, Va., with a low bid of $117,750,000 has been commissioned by the Navy to build its third 60,000-ton supercarrier.

Concurrently the Navy departed from its policy of awarding work to the lowest bidder and gave Bethlehem Steel Co. a $53-million contract to build three destroyers. This was done to alleviate severe unemployment at the Quincy, Mass., yard.

One tank landing ship was awarded to the Bath Iron Works, Bath, Me., also to keep that yard going. The contract price will not be figured until the plans have been completed, which will be in about a month.

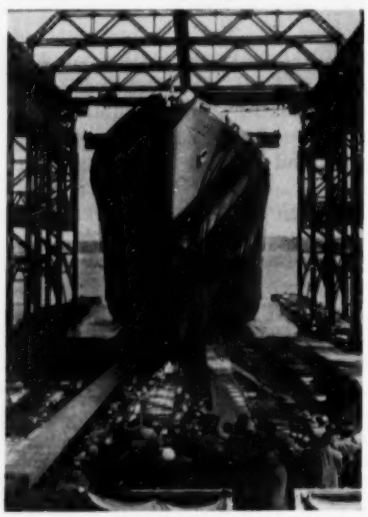
Washington Answering Shipbuilders' SOS

Maritime Administration readies program aimed at reviving ship construction. Unless new orders are received, civilian building may dry up completely by midyear

SOME OF the gloom of the nation's shipbuilders should be dispelled with the proposed new three-point program of the Maritime Administration. Louis S. Rothchild, chairman, says the new plan is about ready to be submitted to the House Merchant Marine and Fisheries Committees and the Senate Interstate and Foreign Commerce Committee.

The program is the first bright spot on the shipbuilding horizon to appear in many months. No new ship construction was booked in 1953, and construction on Mariner dry cargo ships and tankers now on order should be completed by mid-1954.

Subsidy Contracts—Point number one in the program is that of replacing ships under government subsidy contracts. Recently the administration pointed out to ship owners that at least a half-dozen passenger and dry cargo ships have reached the replacement age. A number of owners are interested, and Moore and McCormack and Grace Line are negotiating with the administration. As soon as concrete proposals are submitted, the administration has promised to request funds from Congress. Newtex Corp., subsidiary of Sword Line, New York, is seeking a government advance toward the cost of two proposed train ships. To be operated in the Atlantic Coast and Gulf trade, the ships are designed to carry 128 loaded freight cars or the equivalent in truck trailers. Estimated cost of each ship is $9 million.



SHIP LAUNCHINGS
. . . are more on the way?

The second program point is one under which old tankers would be traded in for credit, plus construction subsidies, against new super tankers. Old tankers would go into a government reserve fleet. Pushing the program is the Navy which has indicated its willingness to sign long-term charters.

Wrinkles — Legislation before Congress would permit trade-in of 10-year-old tankers instead of 12-year-olds now specified under law. Considerable interest has been shown here, too, but several controversial wrinkles must be ironed out.

Some congressmen are against paying ship owners more for old ships than they cost originally, particularly when owners have been operating the tankers profitably for many years. Ship owners point out that tankers now cost 130 per cent more than at the end of World War II. Owners would also like the government to up its insurance of mortgages from 90 to 100 per cent. Owners feel, too, that government should pay for the defense features; in the government's planning for 20-knot speed convoys, owners feel the government should pay for all costs above 15 knots.

The Maritime Administration's third point is based on the assumption that some 1500 liberty ships now moored in government anchorages might have to be used again in another emergency. It proposes to select four ships and equip them with high-speed propulsion machinery—a steam turbine, a geared diesel, diesel-electric and gas turbine. Results of tests with these installations would determine what is to be done with the rest of the Liberties.

PAP Zeros In

Mobilization production planning will be restricted to hard-to-get items

FIRST MAJOR REVISION in the Production Allocation Program since 1947 puts planning emphasis where it belongs—on hard-to-get items.

The PAP is a joint industry-military effort to develop mobilization production schedules during peacetime to shorten administrative lead time in the event of a wartime mobilization.

Zeroing In — The revised program eliminates helter-skelter planning, sets up criteria which items to be considered must meet: Items must be ones (1) requiring long manufacturing lead time, (2) not currently in production or required in quantities far in excess of peacetime production, (3) requiring extensive conversion of peacetime industry, (4) involving materials or techniques essentially different from those in usage, (5) on which industry does not have production experience, or (6) requiring large quantities of critical or strategic materials.

Also, revised PAP sets up a Preferential Planning List of items which might cause production bottlenecks during mobilization. Planning on these is mandatory and will be reviewed yearly.

Nothing More — Charles S. Thomas, assistant secretary of defense for supply and logistics, says completed planning on items which do not fit the new criteria will remain in effect. But no new planning of the production allocation type will be initiated on items not fitting the program.

GSA Purchases Drag Along

Progress of the government's purchase program of various strategic materials has been reported through Dec. 31, 1953, by the General Services Administration. This program was established to stimulate the search for and production of these materials and is separate from the Defense Minerals Exploration Administration's exploration program.

Tungsten: Purchase of 3 million short ton units (20 pounds each) authorized. Delivered are 599,893 short ton units.

Manganese: Purchase of 37 million long ton units (22.4 pounds each) authorized. Delivered are 3,864,962 long ton units.

Chrome: Purchase of 200,000 gross tons authorized. Delivered are 46,640 tons.

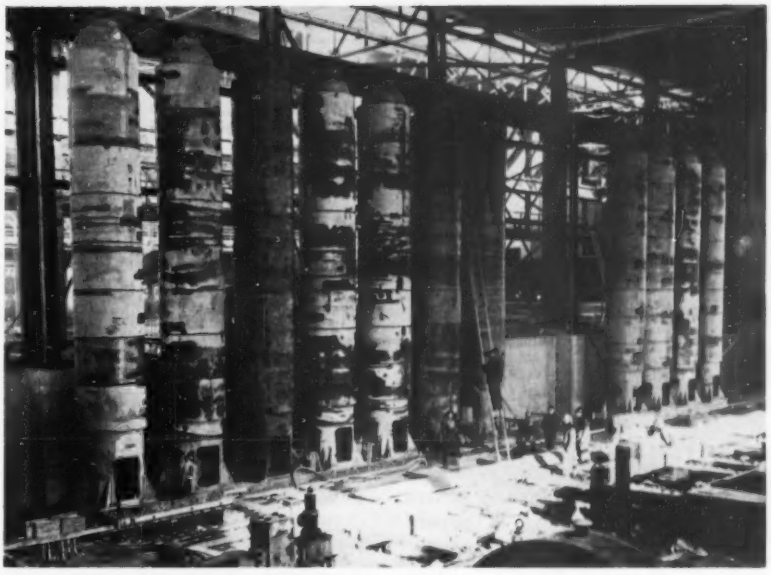
Mica: Purchase of 25,000 net tons of hand-cobbed mica or the equivalent authorized. Delivered are 2593 tons.

Beryl: Purchase of 1500 net tons authorized. Delivered are 145 tons.

Asbestos: Purchase of 1500 net tons of Crude No. 1 and/or No. 2 authorized. Delivered 176 tons.

Columbium-Tantalum: Purchase in lots of 2000 pounds and over from both domestic and foreign sources authorized. Delivered are 3,485,507 pounds.

Purchase of 15 million pounds of contained combined columbium-tantalum pentoxide has been authorized.



Water Bottles for Big Squeeze

Eleven giant steel bottles being installed at the Wyman-Gordon Co., Worcester, Mass., will form the hydraulic accumulator station for 50,000 and 35,000-ton die forging presses, now being built for U. S. A. F. heavy press program by Loewy-Hydropress Inc., N. Y. Seven pumps totaling 10,500 hp will charge the 38-foot-tall bottles with water at a pressure of 4500 pounds per square inch

Aluminum Setasides Reduced

Aluminum setasides for second quarter, 1954, will be 28 million pounds less than the amount set aside in the preceding quarter, says the Business & Defense Services Administration.

That means military and AEC needs will require 166 million pounds of aluminum to be set aside in second quarter, 1954, or 19 per cent of the anticipated supply of domestic and imported primary aluminum for that period. First quarter, 1954, setasides were 24 per cent of available supply.

Machine Tool Needs Cut

Business & Defense Services Administration is liberalizing its order M41 to permit machine tool builders, with certain exceptions, to set aside only 40 per cent of capacity for the military. The change reverses the previous ratio of 60 per cent military and 40 per cent civilian. Effective date: June.

Exceptions to the change are jig borers, jig grinders, jig filling machines and No. 4 and larger milling machines. On these the military setaside is 70 per cent.

The Atomic Energy Commission will still have a priority out of the nonmilitary percentage.

By E. C. KREUTZBERG *Washington Editor*

Commerce Steps Up Its Program To Help Industry on Distribution

DO YOU HAVE a tough marketing or sales problem? The Commerce department's new Office of Distribution may have the answer you're seeking.

Sales executives, sales promotion research men, trade association officials, teachers and others are writing or calling in person increasingly for help in solving distribution bottlenecks. Many companies regularly are using OOD information in measuring and blocking out markets, and numbers of them are setting their geographical sales quotas on the basis of yardsticks furnished by the agency. OOD information is proving helpful not only in the distribution of consumers' soft and hard goods but also machine tools and allied industrial capital equipment.

The Office of Distribution is a lineal descendant of the Marketing Division set up in the Commerce Department just before the Korean war and later transferred to the National Production Authority as the Office of Civilian Requirements. OOD was made a component of the new Business & Defense Services Administration last October to help business and industry improve its distribution system by blocking out potential new markets. Due to the prevalence of sellers' markets during the rearmament period the work in the earlier years never got off to a proper start. Now, with so many companies hungry for business, it is becoming a different story.

Fountain of Information . . .

In its main function, the OOD serves as a central reference point for all types of government information that can be used in measuring and developing markets. Much such information is gathered and reported by the Census bureau and already is used widely by industry. But a great deal of vital information, about which most distribution men are unaware, is collected by the many government departments that require it for administrative purposes—and that is where the OOD is especially valuable.

It takes this information in its raw form, analyzes, interprets and rearranges it and makes it available for use in market planning. Thus, the many companies who do not have their own facilities for searching out and assembling these data into usable form can get it from the OOD.

As an example, take the comprehensive information which the government compiles at great expense for administering the old age and survivors' insurance program. This has been redressed into an array of marketing guides published biennially by the Census Bureau under the title "County Business Patterns."

It shows total payrolls, total employment, number of establishments by employee size for individual industry classifications in each state and county throughout the country. Many companies find this information of great help in locating branch sales offices and warehouse stocks, blocking out sales territories, working out advertising campaigns, setting sales quotas and setting up other programs.

Other functions of the OOD are based to a considerable extent on the long-standing realization in Commerce that American industry understands production much better than distribution, so that the emphasis must be on developing more effective and efficient distribution methods. This can be done with information which will help sellers locate more customers with purchasing power and by eliminating as far as possible any obstacles that might hinder distribution.

Thus, OOD reviews existing and proposed federal legislation and, when appropriate, recommends action aimed at protecting the welfare of the distribution industries. For example, OOD would be concerned over any question as to the right of a seller to absorb freight in order to meet a competitor's lower delivered price.

Improvements Coming . . .

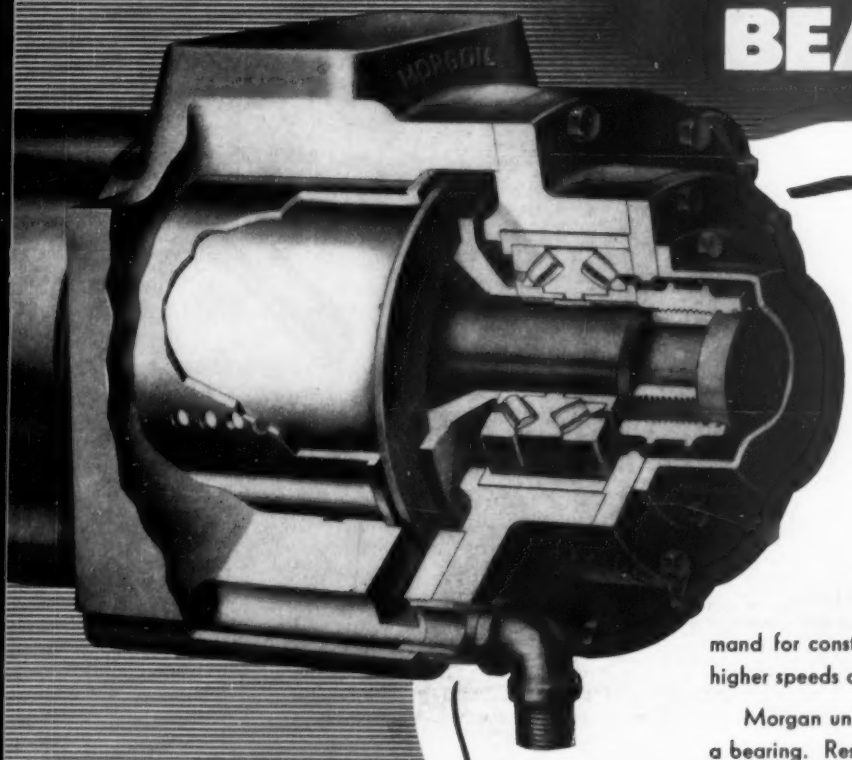
Harry W. Ketchum, acting director of OOD, told STEEL that suggestions originating in the National Distribution Council are given keen attention. The council is a body of sales managers and other distribution executives from private industry appointed by the secretary of Commerce as an advisory group.

Mr. Ketchum seeks to set up a two-way flow of information with key trade associations concerned with distribution and marketing problems. In addition, Mr. Ketchum and his aides make it a practice to attend conventions at which marketing matters are discussed. In these ways the OOD hopes to be of even more help as time goes on by getting a better understanding of industry's distribution requirements.

HARRY W. KETCHUM
. . . aid on distribution

MORGOIL

ROLL NECK BEARINGS



As the modern rolling mill was developed it became evident that an entirely new type of roll neck bearing would be required to cope with the demand for constantly increasing rolling pressures, higher speeds and closer tolerances.

Morgan undertook the development of such a bearing. Research was begun . . . and much of it was carried on in our customers' plants, at their invitation.

The first Morgoils were installed in 1932 and were at once successful. Though today the use of Morgoils is worldwide, the research and development goes on . . . in anticipation of your future needs.

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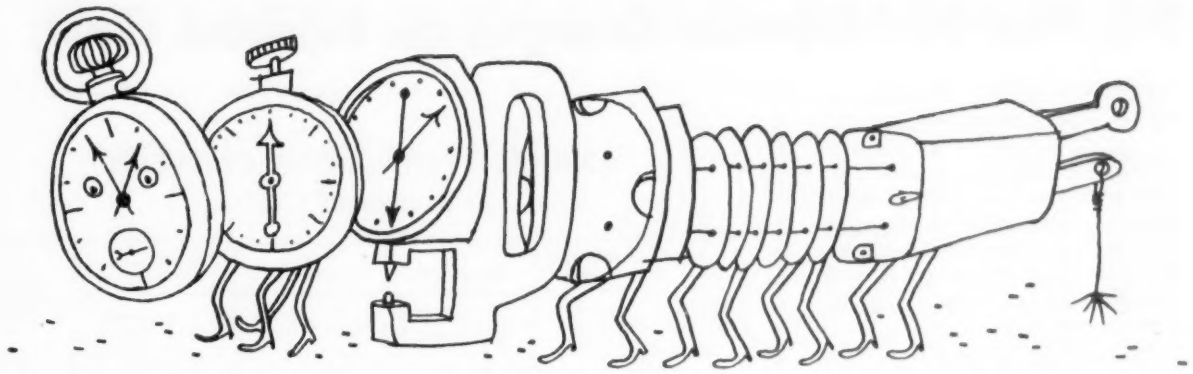


Elgin Plans Its Own Metamorphosis

THE UNORTHODOX can sometimes be an effective tool. At least that was the thinking of the Elgin National Watch Co. when it was getting its "Enterprises Wanted" program for diversification under way a year and a half ago.

Most companies would begin a diversification program by operating through a broker or investment house. But Elgin executives, thinking that a "shouting from the roof tops" approach would bring contact with more companies interested in affiliation more quickly, started their program with a press luncheon in New York. The approach hit its mark; Elgin since that luncheon has obtained 382 lead source contacts and compiled a list of 54 companies with affiliation possibilities.

Aside from the general Elgin goal of healthy expansion, greater stability and improved investment return, company officials were faced with the simple fact that opportunities in the precision watch industry are limited. Foreign competition with its tremendous labor rate advantage is cutting deep into domestic watch markets.

Taking into cognizance its three basic assets—quality, miniaturization and precision—Elgin set out with the help of a business-consultant firm to determine where its greatest diversification potential lay. The two fields finally selected were miniature electronics and precision production instruments. Both are "frontier fields" ideally suited to the company's production skill and engineering and design experience. Electronics growth has been impressive — manufacturers' sales rose from $576 million in 1946 to $4.3 billion in 1952—and the precision production instrument industry has enjoyed a 21 per cent growth rate annually for the past seven years.

In announcing its program in August, 1952, and in a specially prepared brochure, Elgin executives placed all the cards on the table. Elgin is offering companies interested in affiliation: Research and engineering facilities, design and manufacturing talent, managerial ability, financial backing, marketing experience, extensive foreign connections and wide experience in government contracting.

In return Elgin would like the company: To have had profitable operations over the past two to five years, to have an established system of distribution, a rapidly growing sales volume with demonstrated potential, a net worth of about $1 million, and a high degree of engineering background and talent.

The "shouting" paid off quickly. One of the interesting facets was that 145 of the 382 lead sources were business executives. Only 60 were brokers, 56 were investment firms and 12 were banks. Adding more zest to the plan—although such inquiries were not invited—were responses from 35 inventors, some of whose proposals are described as "interesting." Drifting in, too, were offers from employment agencies to help staff new plants, and a couple of aggressive chambers of commerce offered new plant sites with available labor.

Gordon Odell, manager of Elgin's Commercial Development Department, states that a systematic study and weeding-out of a great many companies is under way. "It is of course impossible," he says, "to state when any actual affiliation will occur or what form it will take. But we can state that the search program has been most successful in exposing us to opportunities. There is every reason to believe it will lead ultimately to important measures of diversification for our company."

Luria Amazed at FTC Action

Joel Claster, president, Luria Bros. & Co. Inc., says he was "amazed" to learn of the Federal Trade Commission's charges of alleged monopolistic practices in iron and steel scrap dealings by his company.

The charges (STEEL, Feb. 1, p. 46) name Luria, a Luria subsidiary and 16 iron and steel producers. "We now believe," says Mr. Claster, "that the FTC has been influenced by our competitors for their private purposes in an attempt to obtain business which they could not obtain on the basis of comparative services performed." He adds: "For over two years we have co-operated with the FTC and opened all of our records and books to its personnel in what we were told was a general investigation of the scrap industry."

Still More Steel Expansion Coming as the Population Climbs;

"WITHIN the next 20 years, we will have 45 million more people . . . If the per capita consumption of steel remains what it is today—even if it does not rise, as it always has throughout this century—it will still take 14 more plants of the Fairless Works size to meet the demands of these 45 million new people."

So says U.S. Steel Corp. Chairman Ben Fairless. He keynotes the optimism in an industry which last year added 6.8 million tons to the nation's ingot steel capacity and which plans to add still more in 1954 with an estimated expenditure of $775 million.

Comparison — The table of district capacities at the right shows where the 6.8 million tons has been added to our potential between Jan. 1, 1953, and Jan. 1, 1954. While the district tonnages are based on American Iron & Steel Institute reports for individual companies, STEEL's geographical breakdown on its districts is slightly different than the institute's.

Chicago has the greatest tonnage increase—1,786,100 tons. The district with the second largest increase in the Mid-Atlantic, with a gain of 1 553,420 tons. Third largest gain is scored by St. Louis, with a 1,148,180-ton hike.

Three districts show tonnage losses. Pittsburgh dropped by 516,820 tons, the Far West by 41,000 tons and East-Central New York by 5170 tons.

New Line-Up — The tonnage changes make Chicago the district with the greatest steelmaking capacity in the country. Pittsburgh is displaced as the leader and is now second.

Company by Company — The steel firms which added more than 100,000 tons to their ingot capacity in 1953, according to American Iron & Steel Institute, are: Armco Steel Corp.—184,000 tons; Bethlehem Steel Corp.—900,000 tons; Detroit Steel Corp.—630,000 tons; Ford Motor Co.—106,800 tons; Granite City Steel Co.—570,000 tons; Inland Steel Co.—200,000 tons; McLouth Steel Corp.—388,080 tons; National Steel Corp.—

ANNUAL STEELMAKING CAPACITY

AS OF JANUARY 1, 1954

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Alan Wood Steel Co.	8	625,000					625,000
Allegheny Ludlum Steel Corporation	6	240,000			28	624,200	864,200
American Locomotive Co.	6	181,000					181,000
Armco Steel Corporation	25	2,762,000			9	406,000	3,168,000
Sheffield Steel Corp.	14	1,434,000			2	300,000	1,734,000
Total	39	4,196,000			11	706,000	4,902,000
Atlantic Steel Company	3	188,000			1	112,000	300,000
Babcock & Wilcox Company					4	229,450	229,450
Baldwin-Lima-Hamilton Corp.	5	169,920			(a)1	40	169,960
Barium Steel Corporation:							
Central Iron & Steel Co.	5	360,000			1	46,000	406,000
Industrial Forge & Steel, Inc.	2	48,600					48,600
Phoenix Iron & Steel Co.	6	432,000					432,000
Total	13	840,600			1	46,000	886,600
Bethlehem Steel Corp:							
Bethlehem Steel Co.	126	17,106,000	3	336,000	4	158,000	17,600,000
Bethlehem Pacific Coast Steel Corp.	10	498,000			3	402,000	900,000
Total	136	17,604,000	3	336,000	7	560,000	18,500,000
Borg-Warner Corporation					4	64,000	64,000
Braeburn Alloy Steel Corp.					2	20,730	20,730
Byers Company, A. M.					2	75,000	75,000
Cabot Shops, Inc.					1	12,000	12,000
Cameron Iron Works, Inc.					2	58,800	58,800
Carpenter Steel Company					7	85,800	85,800
Colorado Fuel & Iron Corp.	27	2,231,570					2,231,570
Roebling's Sons Corp., J. A.	9	235,000					235,000
Total	36	2,466,570					2,466,570
Columbia Tool Steel Co.					2	6,600	6,600
Connors Steel Co.					3	67,500	67,500
Continental Steel Corp.	5	394,000					394,000
Copperweld Steel Co.					7	618,380	618,380
Crucible Steel Company of America	9	972,000			17	379,400	1,351,400
Damascus Tube Co.					3	1,800	1,800
Detroit Steel Corp.	14	1,290,000					1,290,000
Disston & Sons, Inc., Henry					2	25,000	25,000
Eastern Stainless Steel Corp.					3	32,000	32,000
Edgewater Steel Co.	3	89,890					89,890
Empire Steel Corporation	7	455,000					455,000
Erie Forge & Steel Corp.	5	234,000					234,000
Finkl & Sons Co., A					2	33,600	33,600
Firth Sterling Inc.					3	20,040	20,040
Ford Motor Company	10	1,531,000			5	224,000	1,755,000
Granite City Steel Co.	16	1,290,000					1,290,000
Green River Steel Corp.					2	241,920	241,920
Harrisburg Steel Corp.	3	100,750					100,750
Heppenstall Company	2	50,470			1	5,080	55,550
Hoster Steel Corporation					1	16,920	16,920
Inland Steel Company	40	4,700,000					4,700,000
International Harvester Company	11	1,000,000					1,000,000
Isaacson Iron Works					2	102,000	102,000
Jessop Steel Company					4	33,490	33,490
Jones & Laughlin Steel Corporation	37	5,583,000	3	582,000	1	1,500	6,166,500
Joslyn Mfg. & Supply Co.					3	37,500	37,500
Judson Steel Corporation	3	76,500					76,500
Kaiser Steel Corp.	9	1,536,000					1,536,000
Keystone Steel & Wire Co.	4	425,000					425,000
Kilby Steel Company					1	34,020	34,020
Knoxville Iron Company					2	38,000	38,000

1953's 6.8-Million-Ton Gain Is Just One Step Along the Way

ANNUAL STEELMAKING CAPACITY

AS OF JANUARY 1, 1954

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Laclede Steel Company	4	440,000					440,000
Latrobe Steel Company					5	24,000	24,000
Le Tourneau, Inc., R. G.					3	83,100	83,100
Lone Star Steel Co.	4	550,000					550,000
Lukens Steel Company	12	750,000					750,000
McLouth Steel Corporation					6	967,780	967,780
Mesta Machine Company	4	85,000			1	20,000	105,000
Midvale Company	4	180,600			7	172,770	353,370
Milton Steel Products Division Merritt-Chapman & Scott Corp.					2	43,000	43,000
National Forge & Ordnance Company					3	25,000	25,000
National Steel Corp.:							
Great Lakes Steel Corp.	17	3,400,000	(b)2				3,400,000
Weirton Steel Co.	13	2,600,000	(b)2				2,600,000
Total	30	6,000,000	(b)4				6,000,000
National Supply Co.					3	50,200	50,200
Newport News Shipbuilding & Dry Dock Co.					3	12,000	12,000
Newport Steel Corp.	7	375,300			3	333,200	708,500
Northwest Steel Rolling Mills, Inc.					2	42,000	42,000
Northwestern Steel & Wire Co.					5	825,000	825,000
Ohio River Steel Div., Louis Berkman Company	4	136,080					136,080
Oregon Steel Mills					3	110,000	110,000
Pacific States Steel Corp.	3	181,770					181,770
Pittsburgh Steel Co.	12	1,404,000					1,404,000
Republic Steel Corp.	78	8,222,000	2	665,000	26	1,375,000	10,262,000
Rotary Electric Steel Co.					6	425,000	425,000
Sharon Steel Corp.	17	1,478,000			2	72,000	1,550,000
Simonds Saw & Steel Co.					3	21,600	21,600
Southwest Steel Rolling Mills					1	45,000	45,000
Stanley Works	3	188,280					188,280
Texas Steel Company					2	36,000	36,000
Timken Roller Bearing Company					9	648,000	648,000
Union Electric Steel Corp.					2	26,760	26,760
United States Steel Corp.:							
United States Steel Corp. (Central Operations)	183	24,664,000	(c)8	1,284,000	9	357,000	26,305,000
American Steel & Wire Div.	26	2,275,000					2,275,000
Columbia-Geneva Steel Div.	19	2,482,000			1	12,000	2,494,000
National Tube Div.	15	2,700,000	6	1,110,000			3,810,000
Tennessee Coal & Iron Div.	23	3,831,000	(b)3				3,831,000
Total	266	35,952,000	17	2,394,000	10	369,000	38,715,000
Universal-Cyclops Steel Corporation					5	70,160	70,160
Vanadium-Alloys Steel Co.					3	11,910	11,910
Colonial Steel Co.					2	30,000	30,000
Total					5	41,910	41,910
Vulcan Crucible Steel Co.					2	9,600	9,600
Washburn Wire Co.	4	93,000					93,000
West Virginia Steel & Mfg. Co.					1	68,000	68,000
Wheeling Steel Corp.	11	1,560,000	2	570,000			2,130,000
Wickwire Brothers, Inc.					1	19,830	19,830
Youngstown Sheet and Tube Company	41	5,260,000	2	240,000			5,500,000
Grand Total	934	109,094,730	(d)33	4,787,000	(e)256	10,448,680	124,330,410

(a) Crucible furnace.
(b) Used in melting charge for open hearth furnaces.
(c) Includes three converters used only in melting charge for open-hearth furnaces.
(d) Includes ten converters used only in melting charge for open-hearth furnaces.
(e) Includes one crucible furnace, annual capacity forty tons.

DISTRICT STEEL CAPACITY

Net Tons, Ingots and Steel for Castings

District	Capacity Jan. 1, 1954	Capacity Jan. 1, 1953
Chicago	24,586,700	22,800,600
Pittsburgh	23,015,780	23,532,600
Mid-Atlantic	16,394,250	14,840,830
Youngstown	10,999,180	10,750,180
Far West	7,022,470	7,063,000
Detroit	6,550,780	5,805,900
Buffalo	6,452,100	6,192,100
Cleveland	6,241,000	6,197,000
Birmingham	5,059,520	4,683,520
Cincinnati	4,875,420	4,053,340
Wheeling	4,866,080	4,496,080
St. Louis	4,645,820	3,500,640
Mid-Ohio	2,896,600	2,873,800
New England	568,280	566,280
East-Central New York	156,430	161,600
TOTAL	124,330,410	117,547,470

350,000 tons; U. S. Steel Corp.—2,316,000 tons; Wheeling Steel Corp.—270,000 tons; and Youngstown Sheet & Tube Co.—552,500 tons.

Total annual coke capacity as of Jan. 1, 1954, was 73,239,540 net tons, compared to 71,181,190 tons a year earlier. Total annual pig iron and ferroalloy capacity on Jan. 1 was 82,001,390 net tons, compared to 79,380,240 tons a year earlier.

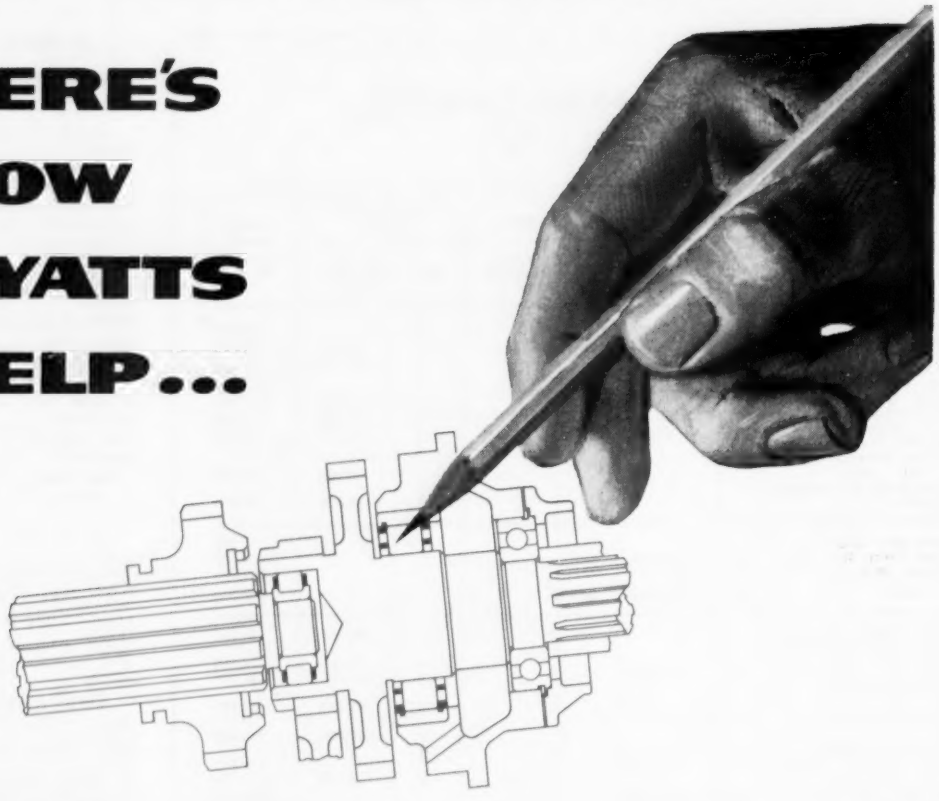
STEEL CAPACITY OF STATES

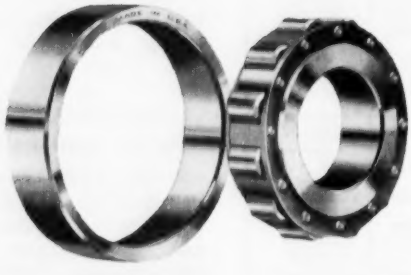
Net Tons, Ingots and Steel for Castings

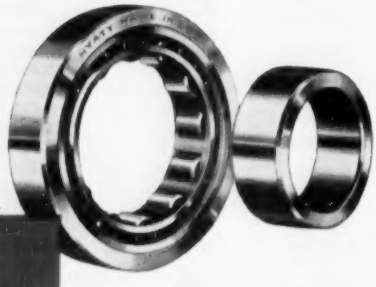
State	Capacity Jan. 1, 1954	Capacity Jan. 1, 1953
Ala.	4,721,520	4,345,520
Calif.	3,158,470	3,343,000
Colo.	1,485,000	1,485,000
Conn.	188,280	188,280
Del.	494,570	494,570
Ga.	300,000	300,000
Ill.	10,800,200	9,720,600
Ind.	14,968,500	13,692,000
Ky.	1,820,420	1,766,500
Md.	5,884,000	5,534,000
Mass.	287,000	275,000
Mich.	6,550,780	5,805,900
Minn.	973,000	918,000
Mo.	630,000	630,000
N. J.	242,800	242,100
N. Y.	6,349,530	6,094,700
Ohio	24,388,060	22,643,260
Okla.	70,920	70,920
Ore.	110,000	110,000
Pa.	34,037,460	33,351,560
R. I.	93,000	93,000
Tenn.	38,000	38,000
Tex.	1,789,900	1,269,720
Utah	1,879,000	1,675,000
Va.	12,000	12,000
Wash.	390,000	450,000
W. Va.	2,668,000	2,998,840
TOTAL	124,330,410	117,547,470

when LIMITED SPACE is a design factor

HERE'S HOW HYATTS HELP...







Sometimes a fraction of an inch is the difference between a simple design modification and costly re-tooling. And the engineer who is thoroughly familiar with Hyatt Roller Bearings will know a lot about how to save those fractions. He'll know, for example, that to gain greater shaft rigidity with the same size housing, he need only check his Hyatt catalog for a separable inner race type of bearing. This type—available in a wide range of sizes—may be applied with the rollers operating directly upon the surface of a suitably hardened and ground shaft. Thus, a larger-diameter shaft may be used without sacrificing bearing capacity, or a larger-size bearing may be used without changing the size of the shaft. For a copy of Hyatt's latest catalog, No. 150, write to Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

STRAIGHT BARREL TAPER

Automakers Try Styling, Power, Extras To Spread New Car Fever

DETROIT

ABOUT THIS TIME of year many car owners begin to feel vague mental discomfort.

The precise etiology varies with individuals, but the end result is always the same—a solemnly documented list of reasons why it would be wise to buy a new car.

Contagious, Too—These are the preliminary stages of a consumer virus known as new car fever. Propagated with considerable enthusiasm by the automakers, the advanced stages of this disease result in complete atrophy of affection for the old bus and purchase of a new one.

Perhaps most infectious is the styling germ. Buick, Olds and Cadillac probably top the crop this year with the virulent wrap-around windshield and a lower appearance that should be a definite competitive advantage. Preliminary January figures indicate that Buick is nosing out Plymouth for the number three national sales spot while Olds and Cadillac are rolling along. Though several makes will go wrap-around in 1955, these GM brands have a nice jump on the year ahead.

Peek-a-Boo — Also noteworthy but of unproven potency are the sky-lighted Ford and Mercury jobs. These could set a trend similar to the hardtop and will bear watching, but for this year Ford has tentatively scheduled only about 2 per cent of production in the peek-a-boo class. Major facelifts of Hudson and Kaiser and less deadly viruses of the color, interior and trim variety mark the remainder of cars offered for 1954.

The familiar horsepower bug continues like the common cold with all but Plymouth, Studebaker and Lincoln offering hikes in some or all models. Most horsepowerful is the Chrysler with 235, but Cadillac at 230 claims more horsepower at the rear wheels. Unusual in the horsepower jumps is the Kaiser Manhattan which accomplishes the boost through the supercharger referred to last week. Also of interest are the Ford and Mercury OHV V-8 engines, the only entirely new power plants introduced this year, while the Buick OHV V-8 now encompasses the whole Buick line.

Accent on Luxury — Although some models like the Willys Falcon, Kaiser Catalina and a few more were dropped this year, a number of new models have been introduced. In most cases the new models emphasize more deluxe features like the Dodge Royal V8, Plymouth Belvedere and Hudson Jet-Liner. The new Pontiac Star Chief offers extended length in addition to luxury appointments, while the Buick Century offers outstanding performance. New special models include the Studebaker Conestoga and Nash Rambler Cross Country station wagons and the new Nash Metropolitan, formerly the NKI, to be introduced in March.

The accessory germ runs rampant this year as well. Power windows, power brakes, power steering and power seats are available on many lower and lower-middle priced makes for the first time. Among special items offered are the transparent top insert for Ford convertibles and the Pontiac fore-and-aft tilting seat and air-conditioning unit.

Mixed Trend—Back-up lights, directional signals, special synthetic upholsteries and a number of former accessories are fast becoming standard equipment on lower priced cars while at the luxury end of things power steering, power brakes and automatic transmissions increase their scope as standard equipment.

As volume of production increases, the price of accessories is dropping, too. Power steering at around $175 last year for most makes is now about $135 in most cases. Still high is air conditioning at around $600 and electric window lifts still rate about $100 on most new car bills. These prices should start to drop by next year.

Big Changes in 1955 — Major styling changes on the broadest scope since the war will highlight new car introductions next year with wrap-around windshields heading the list and at least three new OHV V8's to be introduced. It appears certain that three completely new cars will make their appearance, and the chances are better than even that your favorite will be significantly altered over this year's model.

But if you've got the fever, advice won't help. The price lists on the next page might, however, it has been shown in the past that those who don't have the scratch usually lose the itch.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,152	322,755
September	605,228	595,715
October	651,153	656,767
November	457,852	548,782
December	528,681	569,715
Total	7,829,461	5,989,509

Week Ended	1954	1953
Jan. 2	93,293	106,102
Jan. 9	152,418	139,620
Jan. 16	149,841	148,049
Jan. 23	146,741	149,550
Jan. 30	146,316	150,289
Feb. 6	146,000*	146,809

Source: Ward's Automotive Reports.
*Estimated by STEEL.

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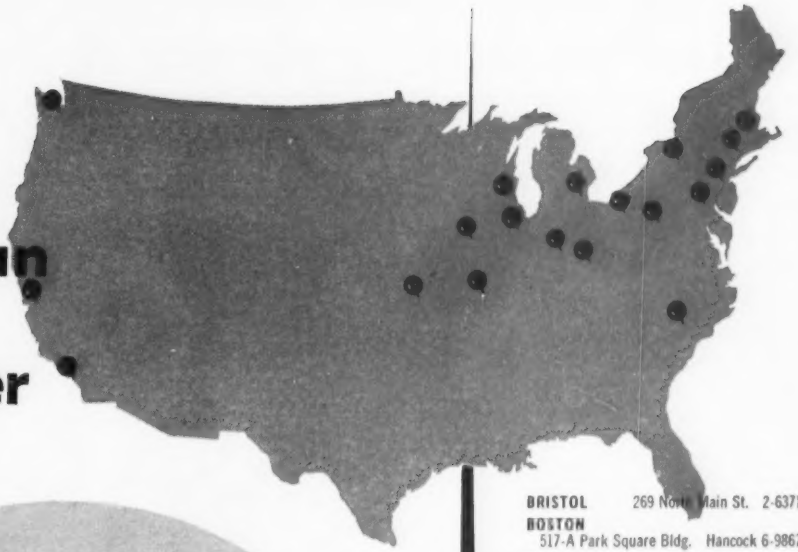
1954 4-DOOR SEDANS – What You Get For Your Money

MAKE	SPECIFICATIONS							COST OF ACCESSORIES†					
	Price*	Wheel-base	Length	Weight	Max. hp at rpm	Compr. Ratio	Engine Type	Over-drive	Auto. Trans.	Power Steer.	Power Brakes	Radio	Heater
CHEVROLET													
150 series	$1680	115	196.4	3210	125/4000‡	7.5-1	OHV-S6	.....	$178.00	$134.50	$37.70	$61.25	$40.50
210 series	1771	115	196.4	3230	125/4000‡	7.5-1	OHV-S6	.....	178.00	134.50	37.70	61.25	40.50
Bel Air	1884	115	196.4	3255	125/4000‡	7.5-1	OHV-S6	.....	178.00	134.50	37.70	61.25	40.50
PONTIAC													
Chieftain 6 Special	2026	122	202.6	3391	118/3800‡	7.7-1‡	L-S6	.....	178.35	134.40	35.50	79.91	80.82
Chieftain 6 Deluxe	2130	122	202.6	3406	118/3800‡	7.7-1‡	L-S6	.....	178.35	134.40	35.50	79.91	80.82
Chieftain 8 Special	2101	122	202.6	3451	127/3800‡	7.7-1‡	L-S8	.....	178.35	134.40	35.50	79.91	80.82
Chieftain 8 Deluxe	2205	122	202.6	3466	127/3800‡	7.7-1‡	L-S8	.....	178.35	134.40	35.50	79.91	80.82
Star Chief Deluxe	2301	124	213.6	3536	127/3800‡	7.7-1‡	L-S8	.....	178.35	134.40	35.50	79.91	80.82
Star Chief Custom	2394	124	213.6	3536	127/3800‡	7.7-1‡	L-S8	.....	178.35	134.40	35.50	79.91	80.82
OLDSMOBILE													
88 series	2337	122	205.2	3692	170/4000	8.2-1	OHV-V8	.....	178.35	134.40	39.80	100.82	79.58
Super 88 series	2476	122	205.2	3734	185/4000	8.2-1	OHV-V8	.....	178.35	134.40	39.80	100.82	79.58
98 series	2805	126	214.2	3846	185/4000	8.2-1	OHV-V8	.....	178.35	134.40	39.80	100.82	79.58
BUICK													
Special	2265	122	206.3	3714	143/4200	7.2-1	OHV-V8	.....	192.50	134.40	49.50	92.50	81.70
Century	2520	122	206.3	3786	195/4100	8.0-1	OHV-V8	.....	192.50	134.40	49.50	92.50	81.70
Super	2711	127	216.8	4105	177/4100	8.0-1	OHV-V8	.....	192.50	134.40	49.50	92.50	81.70
Roadmaster	3269	127	216.8	4250	200/4100	8.5-1	OHV-V8	.....	standard	standard	49.50	92.50	81.70
CADILLAC													
Series 62	3932	129	216.4	NA	230/4400	8.2-1	OHV-V8	.....	standard	standard	47.70	131.95	128.85
Fleetwood 60	4683	133	227.4	NA	230/4400	8.2-1	OHV-V8	.....	standard	standard	47.70	131.95	128.85
PLYMOUTH													
Plaza series	1765	114	193.5	3004	100/3600	7.1-1	L-S6	97.55	145.80	134.40	.....	82.50	56.25
Savoy series	1872	114	193.5	3036	100/3600	7.1-1	L-S6	97.55	145.80	134.40	.....	82.50	56.25
Belvedere series	1953	114	193.5	3050	100/3600	7.1-1	L-S6	97.55	145.80	134.40	.....	82.50	56.25
DODGE													
Meadowbrook 6	1999	119	205.5	3195	110/3600	7.2-1	L-S6	97.55	130.10	.....	.....	82.50	78.25
Meadowbrook V-8	2150	119	205.5	3390	140/4400	7.1-1	OHV-V8	97.55	130.10	.....	.....	82.50	78.25
Coronet 6	2111	119	205.5	3235	110/3600	7.2-1	L-S6	97.55	189.00	134.40	.....	82.50	78.25
Coronet V-8	2219	119	205.5	3405	150/4400	7.5-1	OHV-V8	97.55	189.00	134.40	.....	82.50	78.25
Royal V-8	2347	119	205.5	3425	150/4400	7.5-1	OHV-V8	97.55	189.00	134.40	.....	82.50	78.25
DESOTO													
Powermaster 6	2385	125.5	214.5	3590	116/3600	7.0-1	L-S6	97.75	189.00	139.75	36.55	101.00	78.25
Fire Dome 8	2673	125.5	214.5	3750	170/4400	7.5-1	OHV-V8	97.75	189.00	139.75	36.55	101.00	78.25
CHRYSLER													
Windsor Deluxe	2532	125.5	215.6	3655	119/3600	7.0-1	L-S6	.....	184.00	139.75	36.55	101.00	78.25
New Yorker	3193	125.5	215.6	3970	195/4400	7.5-1	OHV-V8	.....	standard	139.75	standard	101.00	78.25
New Yorker Deluxe	3398	125.5	215.6	4065	235/4400	7.5-1	OHV-V8	.....	standard	139.75	standard	101.00	78.25
Custom Imperial	4224	133.3	223.7	4355	235/4400	7.5-1	OHV-V8	.....	standard	139.75	standard	101.00	78.25
FORD													
Mainline 6	1700	115.5	198	3155	115/3900	7.2-1	OHV-S6	102.00	184.00	134.40	40.00	81.30	71.44
Mainline V-8	1776	115.5	198	3250	130/4200	7.2-1	OHV-V8	102.00	184.00	134.40	40.00	81.30	71.44
Customline 6	1793	115.5	198	3175	115/3900	7.2-1	OHV-S6	102.00	184.00	134.40	40.00	81.30	71.44
Customline V-8	1869	115.5	198	3270	130/4200	7.2-1	OHV-V8	102.00	184.00	134.40	40.00	81.30	71.44
Crestline 6	1898	115.5	198	3185	115/3900	7.2-1	OHV-S6	102.00	184.00	134.40	40.00	81.30	71.44
Crestline V-8	1974	115.5	198	3280	130/4200	7.2-1	OHV-V8	102.00	184.00	134.40	40.00	81.30	71.44
MERCURY													
Custom	2295	118	206.2	3480	161/4400	7.5-1	OHV-V8	102.00	189.77	130.00	37.47	98.57	67.20
Monterey	2350	118	206.2	3515	161/4400	7.5-1	OHV-V8	102.00	189.77	130.00	37.47	98.57	67.20
LINCOLN													
Lincoln	3522	123	214.8	4190	205/4200	8-1	OHV-V8	.....	standard	145.00	40.00	121.60	112.53
Capri	3711	123	214.8	4245	205/4200	8-1	OHV-V8	.....	standard	145.00	40.00	121.60	112.53
HUDSON													
Jet	1858	105	180.6	2675	104/4000§	7.5-1**	L-S6	102.46	178.03	.....	.....	81.81	72.72
Super Jet	1954	105	180.6	2725	104/4000§	7.5-1**	L-S6	102.46	178.03	.....	.....	81.81	72.72
Jet Liner	2036	105	180.6	2760	104/4000§	7.5-1**	L-S6	102.46	178.03	.....	.....	81.81	72.72
Wasp	2256	119.8	201.5	3440	126/4400§	7.0-1	L-S6	110.77	178.03	177.38	42.80	99.82	74.39
Super Wasp	2465	119.8	202.9	3525	140/4000§	7.0-1	L-S6	110.77	178.03	177.38	42.80	99.82	74.39
Hornet	2768	123.8	208.8	3620	160/3800§	7.5-1	L-S6	110.77	178.03	177.38	42.80	99.82	74.39
KAISER													
Kaiser Special	NA	118.5	213.8	3210	118/3650	7.3-1	L-S6	98.79	165.00	NA	.....	83.50	51.50
Manhattan	NA	118.5	215.6	3275	140/3900	7.3-1	L-S6††	98.79	165.00	NA	.....	33.50	51.50
NASH													
Rambler Super	1795	108	193.3	2605	90/3800	7.3-1	L-S6	103.50	178.85	.....	39.25	NA	NA
Rambler Custom	1965	108	193.3	2665	90/3800	7.3-1	L-S6	103.50	178.85	.....	39.25	NA	NA
Statesman Super	2158	114.2	202.2	3045	110/4000	8.5-1	L-S6	103.50	178.85	139.50	39.25	89.60	77.45
Statesman Custom	2332	114.2	202.2	3070	110/4000	8.5-1	L-S6	103.50	178.85	139.50	39.25	89.60	77.45
Ambassador Super	2412	121.2	209.2	3430	130/3700	7.6-1	OVH-S6	112.25	178.85	149.50	32.25	89.60	77.45
Ambassador Custom	2595	121.2	209.2	3480	130/3700	7.6-1	OVH-S6	112.25	178.85	149.50	32.25	89.60	77.45
PACKARD													
Clipper Deluxe	2695	122	215.7	3795	165/3600	8.0-1	L-S8	110.00	199.00	177.50	43.00	102.00	79.50
Clipper Super	2815	122	215.7	3830	165/3600	8.0-1	L-S8	110.00	199.00	177.50	43.00	102.00	79.50
Cavalier	3344	127	216.7	4090	185/4000	8.0-1	L-S8	110.00	199.00	177.50	43.00	102.00	79.50
Patrician	3890	127	216.7	4190	212/4000	8.7-1	L-S8	.....	standard	177.50	43.00	102.00	79.50
STUDEBAKER													
Champion Custom	1801	116.5	198.6	2770	85/4000	7.5-1	L-S6	105.35	216.11	177.38	.....	63.84	65.92
Champion Deluxe	1918	116.5	198.6	2770	85/4000	7.5-1	L-S6	105.35	216.11	177.38	.....	63.84	65.92
Champion Regal	2026	116.5	198.6	2770	85/4000	7.5-1	L-S6	105.35	216.11	177.38	.....	63.84	65.92
Commander Deluxe	2179	116.5	198.6	3120	120/4000	7.5-1	OHV-V8	118.25	226.50	177.38	.....	63.84	65.92
Commander Regal	2287	116.5	198.6	3120	120/4000	7.5-1	OHV-V8	118.25	226.50	177.38	.....	63.84	65.92
Land Cruiser	2438	120.5	202.6	3230	120/4000	7.5-1	OHV-V8	118.25	226.50	177.38	.....	63.84	65.92
WILLYS													
Lark	NA	108	180.8	2661	90/4200	7.6-1	F-S6	80.00	NA	NA	.....	74.25	62.81
Ace	NA	108	180.8	2778	115/3650	7.3-1	F-S6	80.00	NA	NA	.....	74.25	62.81

* Factory delivered price including federal excise tax, delivery and handling charges exclusive of state and local taxes and all optional equipment. † Suggested delivered price. ‡ Lower with standard transmission. § Higher with optional twin carburetors. ** Higher with optional aluminum head. †† Supercharger standard.

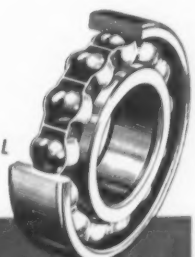
every salesman an engineer



BRISTOL 269 North Main St. 2-6371
BOSTON
517-A Park Square Bldg. Hancock 6-9867
KANNAPOLIS, N. C. P.O. Box 1086 2-3181
NEW YORK 1775 Broadway Circle 6-1540
PHILADELPHIA
850 East Luzerne St. Garfield 3-4136
SYRACUSE 2360 James St. 73-5195
DETROIT
7-122 General Motors Bldg. Trinity 2-4700
CINCINNATI
2107 Carew Tower Main 5783
CLEVELAND
3113 W. 110th St. Winston 1-5454
INDIANAPOLIS
1357 W. 18th St. Imperial 4680
PITTSBURGH
Cathedral Mansions Mayflower 1-8100
CHICAGO
332 So. Michigan Ave. Wabash 2-5875
DAVENPORT
2212 E. 12th St. Davenport 7-7522
KANSAS CITY
1021 E. Linwood Blvd. Valentine 4939
MILWAUKEE
647 W. Virginia St. Broadway 6-9460
ST. LOUIS
3001 Washington Blvd. Franklin 6533
LOS ANGELES
5035 Gifford Ave. Logan 8-2301
BERKELEY
1716 Fourth St. Landscape 6-8750
SEATTLE 5000 First Ave., S. Lander 5920

Close at hand to *lend* a hand! Whenever a design calls for **ball** bearings, call in your New Departure sales *engineer*. You'll find that he's a specialist in solving anti-friction problems. You'll find, too, that he cooperates efficiently with your designers and engineers. He's backed by the industry's most complete research and manufacturing facilities. *Whatever your* **ball** *bearing needs, be sure to talk them over with a New Departure sales engineer.*

NOTHING ROLLS LIKE A BALL



NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
Plants also in Meriden, Connecticut, and Sandusky, Ohio

Microscope checks grain size of every shipment

Another reason why you get uniform, high-quality forgings with TIMKEN® forging steels!

FORGINGS made from Timken® forging steels have uniformly high ductility and resistance to impact. You have fewer rejects. That's because Timken forging steels have uniform grain size after heat treatment—from bar to bar and heat to heat. Grain size and chip grain size of every shipment is checked under a microscope.

Better control of chemical composition of Timken forging steels from heat to heat is obtained by modern devices such as the direct-reading spectrometer. In just 40 seconds, it can chemically analyze a molten heat!

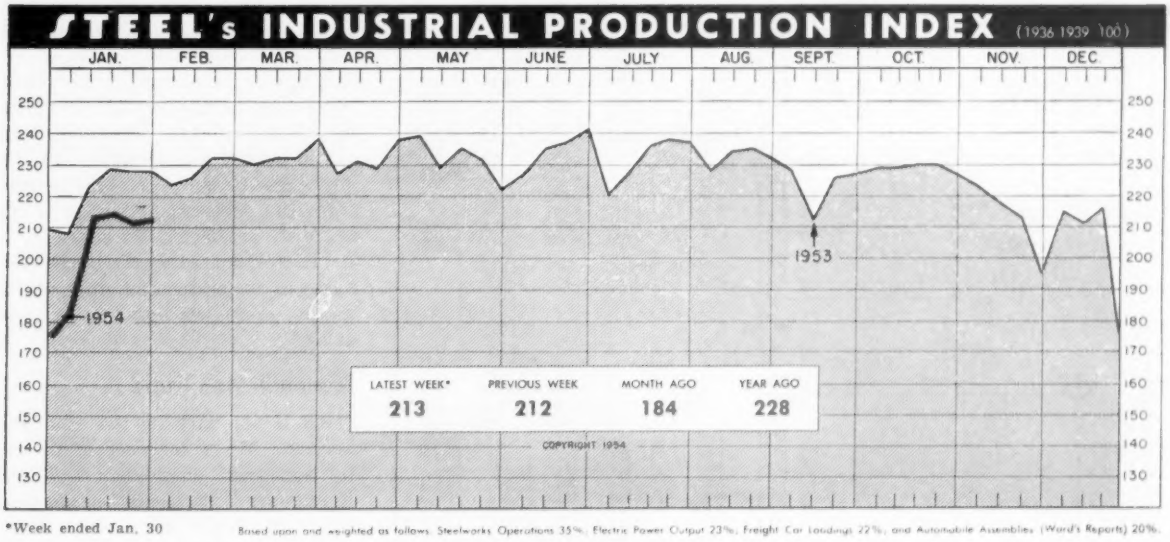
Fewer furnace adjustments are needed when you use Timken forging steels. You get uniform physical properties, uniform chemical composition. Result: uniform response to heat treatment and uniform forgeability—from bar to bar and heat to heat.

Your order for Timken forging steels is handled individually in our mills. We target conditioning procedure to your particular forging requirements. You can hold rejects to a minimum. And you save steel because the good dimensional tolerances of Timken steel forging bars produce uniform weight multiples with a minimum of steel lost in the flashings.

Timken forging steels can help you turn out higher quality forgings than ever before. For full information, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING


STEEL's INDUSTRIAL PRODUCTION INDEX (1936 1939 100)
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
250 240 230 220 210 200 190 180 170 160 150 140 130
1954
1953
LATEST WEEK* 213
PREVIOUS WEEK 212
MONTH AGO 184
YEAR AGO 228
COPYRIGHT 1954

*Week ended Jan. 30

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Industry's Job: Keep Business Sound and Good

AMERICAN BUSINESS, not government, has the ability to keep our economy sound! After 21 years, and once again at a time of economic change, this premise still contains the philosophy of most businessmen and the hopes of most other Americans. Unlike the early thirties when opponents of this credo blamed businessmen for the ills of our economy, present-day proponents of the belief can cite the mess in which our economy finds itself due to government paternalism.

Government Can't Do It . . .

In support of this tenet Benjamin F. Fairless, chairman of U. S. Steel Corp., says government actions couldn't overcome the forces of depression. No effort to produce a great inflation, no piling of deficit upon deficit, no huge public works program could bring prosperity or end unemployment, he asserts.

Business Can . . .

Projected government spending of $15 billion to prevent a recession is "small potatoes." Last year the private expenditures for plant and equipment alone amounted to $28 billion. "Now that is what American business can do—and is doing—to prevent depression. It is the only way I know to increase the earning power, the purchasing power and the living standard of all our people, in every walk of life," Mr. Fairless declares.

It's Business' Job . . .

"And it is our job! No government can do it for us." That statement of Mr. Fairless is similar to the policy of the Eisenhower administration, as revealed in its classic Economic Report. The policy: To provide a favorable climate for business to operate in. Broadly, it includes both over-all and individual business incentives. If this doesn't produce the desired effect, spending for public works will be requested.

A Job Well Done . . .

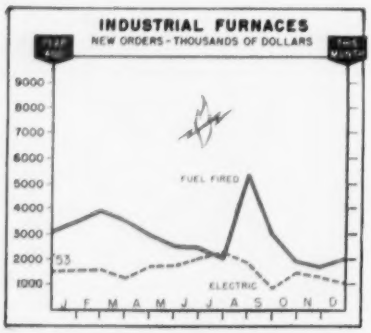
Mr. Fairless points out the Du Pont company as an example of the possibilities inherent in our system. Even its slogan, "Better Things for Better Living...Through Chemistry," illustrates a prime economic goal—more for less. He tells how Du Pont's spending for research, development and marketing led to nylon, orlon, dacron, cellophane, neoprene, freon gas, lucite, butacite and many others. They are products that today account for nearly half of Du Pont's sales and have strengthened the economy by providing hundreds of businesses and thousands of jobs.

Favorable Earnings Seen . . .

Near-record stock market price level also indicates a favorable position for business. It is favorable in that earnings of large companies may provide as good a dividend crop as in 1953. Showing the way to do this are such concerns as Koppers Co., which despite a sharp decrease in sales last year had higher earnings than in the record sales year of 1952. Higher profit-sales ratio was credited to better operating performance and improved processes and facilities.

Defense and Profits . . .

American Steel Foundries also raised its profit-sales ratio in the

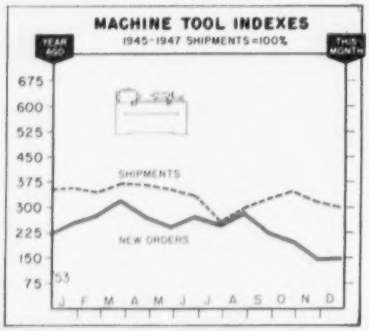


Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1953	1952	1953	1952
Jan.	3,540	3,379	1,655	2,856
Feb.	3,996	2,413	1,672	1,363
Mar.	3,607	1,813	1,301	2,100
Apr.	3,017	3,606	1,796	2,298
May	2,609	3,032	1,799	3,713
June	2,550	2,954	2,095	1,552
July	2,017	6,728	2,246	2,530
Aug.	5,465	5,259	1,904	1,626
Sept.	3,019	2,462	873	1,412
Oct.	1,975	1,507	1,539	2,459
Nov.	1,692	2,382	1,256	1,241
Dec.	2,013	3,235	1,014	1,634

*Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.

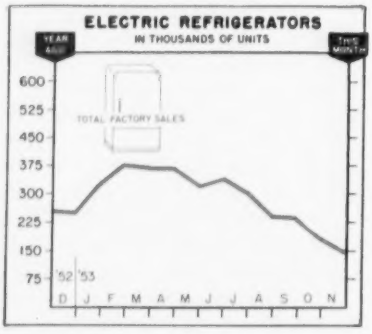


Machine Tool Indexes

1945-1947 Shipments=100

	New Orders		Shipments	
	1953	1952	1953	1952
Jan.	255.8	347.8	361.6	266.6
Feb.	282.1	318.8	354.5	279.6
Mar.	327.0	324.3	375.9	299.5
Apr.	276.8	293.5	372.7	307.9
May	246.4	284.6	356.0	323.0
June	273.4	342.9	342.2	330.8
July	247.3	376.3	267.6	259.7
Aug.	286.9	311.1	299.6	317.0
Sept.	223.7	302.4	328.3	368.3
Oct.	198.7	243.3	348.4	357.8
Nov.	146.6	205.4	320.2	342.5
Dec.	149.2	225.2	303.1	355.0

National Machine Tool Builders' Assn.

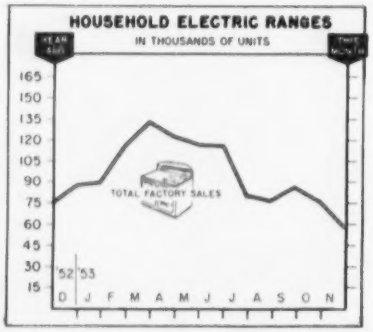


Electric Refrigerators

Total Factory Sales—Units

	1953	1952	1951
Jan.	325,186	260,259	465,903
Feb.	377,605	259,838	403,035
Mar.	368,498	276,972	558,503
Apr.	366,951	225,994	409,887
May	317,667	217,017	309,722
June	343,114	324,885	261,298
July	298,838	333,877	163,922
Aug.	232,981	250,224	165,309
Sept.	231,224	230,111	193,929
Oct.	179,749	207,065	191,519
Nov.	139,511	256,530	147,394
Dec.	.....	248,506	195,403
Total	.....	3,091,434	3,465,824

National Electrical Mfrs. Assn.



Household Electric Ranges

Total Factory Sales—Units

	1953	1952	1951
Jan.	88,145	79,982	130,316
Feb.	114,465	63,063	121,585
Mar.	130,788	93,225	159,865
Apr.	118,999	69,149	118,823
May	114,404	68,117	106,685
June	113,086	86,847	106,589
July	77,836	83,465	60,530
Aug.	74,326	74,853	64,042
Sept.	84,481	62,404	93,551
Oct.	73,422	63,143	109,043
Nov.	55,748	72,982	101,476
Dec.	.....	84,630	72,140
Total	.....	901,860	1,244,645

National Electrical Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Dec. 28	Gray Iron Castings..Jan. 18	Ranges, Gas .....Jan. 11
Durable Goods ....Dec. 14	Indus. Production..Nov. 23	Steel Castings .....Jan. 18
Employ., Metalwk. Jan. 25	Ironers .....Nov. 23	Steel Forgings ....Feb. 1
Employ., Steel ....Feb. 1	Malleable Castings..Jan. 18	Steel Shipments ....Jan. 11
Fab. Struc. Steel...Dec. 21	Prices, Consumer ..Dec. 7	Vacuum Cleaners ..Jan. 11
Foundry Equip. ...Jan. 25	Prices, Wholesale..Feb. 1	Wages, Metalwk. ..Feb. 1
Freight Cars .....Jan. 25	Pumps .....Nov. 16	Washers .....Dec. 21
Gears .....Dec. 21	Radio, TV .....Jan. 25	Water Heaters ....Jan. 11

fourth quarter last year as compared with the corresponding quarter in 1952. Elimination of low profit operations at the government-owned cast armor plant started its profit climbing. On the other hand, low-profit defense business helped Oliver Corp. set a sales record in the fiscal year ended Oct. 31, yet caused its profit to decline from the preceding year. A. King McCord, president, explained that it takes about $2 worth of defense business to produce as much profit as $1 worth of regular product sales.

Economic Stabilizers . . .

All is not dark on the economic horizon. There is proof of efforts to regularize employment. Nash-Kelvinator Corp.'s 6800 production employees voted to go on a four-day week rather than face a layoff of 1700 people. Also helping mitigate downward economic trends is the awarding of $15-million contract for 2500 steel-sheathed box cars for the New York Central Railroad.

Weed Out Inefficient . . .

Looking at employment conditions, the business survey committee of the National Association of Purchasing Agents says that 47 per cent of the members participating in the survey reported lower payrolls in January. "Over-all, the cutbacks have not been steep. Many report a weeding out of the least efficient and failure to replace the normal quits." As a result of the changes, productivity is rising, skilled help is now available in several areas, and there are more applicants applying for white-collar jobs.

Car Market Tightens . . .

With January's sales of new automobiles below expectations, inventories were building up to record levels. The tightening car market caused production slashes during the month for all makes except Oldsmobile and Chrysler. February schedule of 479,000 passenger cars is 84,000 less than originally projected.

Big Three in Output Race . . .

The Big Three drove away 94.5 per cent of January car comple-

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	73.0	74.0	99.5
Electric Power Distributed (million kwhr)	8,855	8,976	8,151
Bitum. Coal Output (daily av.—1000 tons)	1,362	1,363	1,535
Petroleum Production (daily av.—1000 bbls)	6,275[1]	6,292	6,492
Construction Volume (ENR—millions)	$171.1	$173.5	$229.1
Automobile, Truck Output (Ward's—units)	146,316	146,741	150,289
TRADE			
Freight Car Loadings (unit—1000 cars)	615[1]	617	691
Business Failures (Dun & Bradstreet, no.)	233	208	162
Currency in Circulation (millions)[3]	$29,900	$30,083	$29,592
Dept. Store Sales (changes from year ago)[3]	+1%	−8%	+4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,509	$19,211	$17,292
Federal Gross Debt (billions)	$274.9	$275.2	$267.3
Bond Volume, NYSE (millions)	$22.2	$22.7	$18.3
Stocks Sales, NYSE (thousands of shares)	9,685	9,018	8,208
Loans and Investments (billions)[4]	$79.8	$80.4	$77.7
U. S. Gov't Obligations Held (billions)[4]	$33.0	$32.9	$32.0
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	203.3	203.2	213.4
All Commodities[7]	110.9	110.9	109.9
Commodities Other Than Farm & Foods[7]	114.5	114.5	113.1

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1954, 2,384,549; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

tions, squeezing the independents ever more. With General Motors taking 46.7 per cent and Ford 33.5 per cent, Chrysler accounted for only 14.3 per cent of industry outturn. During February, GM's output will rise slightly while Ford's moves gently downward. The independents will make up for the larger part of the small slack in Chrysler outturn.

Popular Station Wagons . . .

Great demand for station wagons has caused the automobile industry to give it special attention. With the lowest-priced station wagon invariably the best seller, Buick has transferred models from its highest-priced series to its lowest-priced series, and Pontiac, Chrysler and Nash have reduced prices. Capitalizing on the buying trend last year, Dodge pushed from seventh to fourth among such producers.

Transportation Needs . . .

Looking at the future for the petroleum industry, Stanley C. Hope, president, Esso-Standard Oil Co., sees a clearly indicated need for additional transportation. He points to the 12 million automobiles on the highways of pre-war vintage, the 17 million families without a car and the 37 per cent of farms on which there is no car.

No Further Decline? . . .

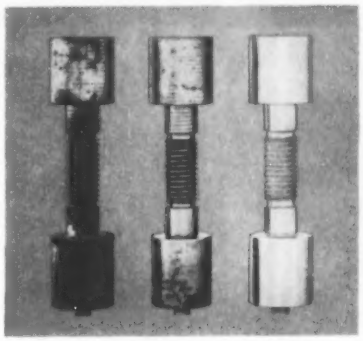
Looking nearer at hand, industrial production in January was estimated at 127 per cent of the 1947-1949 average by the Federal Reserve Board. Output at this level was about 4.5 per cent below the same month in 1953, a period of business pickup, and 1.5 per cent less than in November, 1953. On a preliminary basis there appears to be no further decline from December. In the week ended Jan. 30, STEEL's index of industrial production rose 1 point above the preceding week to 213 per cent of the 1936-1939 average, 29 points below the comparable week in 1953.

Trends Fore and Aft . . .

Shaeffer Pen Co. is stepping up manufacturing operations to a six-day week to meet the biggest post-Christmas business rush in its history . . . U. S. consumer credit outstanding rose to $28.8 billion in December, $3 billion above the corresponding month in 1952 and $644 million above previous month.

NEW WAY TO STOP RUST

Easily! Quickly! Without Slushing!



Without VPI With VPI

MARVELLUM

vpi WRAP

Paper coated with a Volatile Corrosion Inhibitor

Look at these steel samples—they tell the story. After 3 years of unsheltered storage outdoors in an industrial marine atmosphere, only the VPI wrapped sample on the right is still bright and clean. The untreated sample on the left was wrapped in plain kraft, the middle one treated with a good rust-preventive oil and wrapped in Grade A barrier material. All were overwrapped with kraft-asphalt paper.

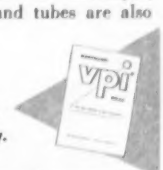
A special coating on the VPI paper vaporizes . . . forms an invisible protective film that positively prevents rust.

Marvellum VPI is easy to use . . . just fold the paper over the part. No need for time-consuming slushing or greasing. No mess or costly cleaning when the item is unwrapped. It's bright and clean, ready for immediate use.

You'll find many uses for Marvellum VPI in your plant . . . wrap steel parts, protect inventories, line tote boxes.

Marvellum VPI is available in rolls of 20, 30, 40 and 60 lb. paper stock and can be individually imprinted with your trademark on quantity orders. Envelopes, sheets, bags, shrouds and tubes are also available.

FREE BOOKLET
Gives you all the facts.
Send for your copy today.



The Marvellum Company
1 Appleton Street Holyoke, Mass.

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

Choose from 11 types of Ohio Iron and Steel Rolls:

Carbon Steel Rolls	Denso Iron Rolls
Ohioloy Rolls	Nickel Grain Rolls
Ohioloy "K" Rolls	Special Iron Rolls
Holl-O-Cast Rolls	Nioloy Rolls
Chilled Iron Rolls	Flintuff Rolls

Ohio Double-Pour Rolls

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO — **Plants at Lima and Springfield, Ohio**

E. CLAIR BOOK
. . . purchasing agent for Lukens Steel

E. Clair Book succeeds **Hugh Kenworthy** as purchasing agent of **Lukens Steel Co.**, Coatesville, Pa. Mr. Kenworthy, who has held that position since 1929, will retire June 30. Until that time he will remain with the company in an advisory capacity. Mr. Book has been senior assistant purchasing agent.

Jack Palmer was appointed works manager in charge of production and engineering, **S. U. S. Die Casting Co. Inc.**, Logansport, Ind. He most recently was plant manager and chief engineer for Castmaster Inc., Cleveland.

Floyd Smith, former general superintendent, was appointed works manager of the Bossert Division of **Rockwell Spring & Axle Co.**, Utica, N. Y. He succeeds **Henry M. Klein**, retired. **John Gibson** was named to succeed Mr. Smith. **George Fauth** was made chief engineer.

James P. Beyser, works manager since 1948 for Blaw-Knox Co.'s **Buflovak Equipment Division** at Buffalo, was appointed to succeed **Charles W. Pearson** as vice president and general manager. **Lambert J. Wischerath**, for some years assistant to Mr. Pearson, was named a vice president of the division. With 48 years of service at Buflovak, Mr. Pearson has retired but continues as a director of the company and as a consultant to the Blaw-Knox management.

ALF E. WEROLIN
. . . National Motor Bearing v. p.-gen. mgr.

Alf E. Werolin, vice president in charge of administration and planning, **National Motor Bearing Co. Inc.**, Redwood, Calif., has been given broader responsibilities as general manager of the company. He fills a position formerly held by **Lloyd A. Johnson**, chairman and president.

J. D. McCall, general superintendent at the Pittsburg, Calif., works of **Columbia-Geneva Steel Division**, U. S. Steel Corp., was transferred to the San Francisco headquarters of the division as assistant general manager of operations, a newly created position. He will assist **L. J. Westhaver**, newly appointed general manager-operations. **Donald E. Rice** succeeds Mr. McCall at Pittsburg, and **R. B. Freeman** becomes assistant general superintendent there. **C. C. Morgan** is the new general superintendent at Torrance, Calif.

Alden E. Acker was elected president, **Hycon Mfg. Co.**, Pasadena, Calif. He succeeds **Harry Oedekerk**, now chairman of the board.

Frederick C. Matthaei Sr., founder and president of **American Metal Products Co.**, Detroit, was elevated to chairman of the board. Succeeding him as president and chief executive officer is **Douglas F. Roby**, formerly executive vice president.

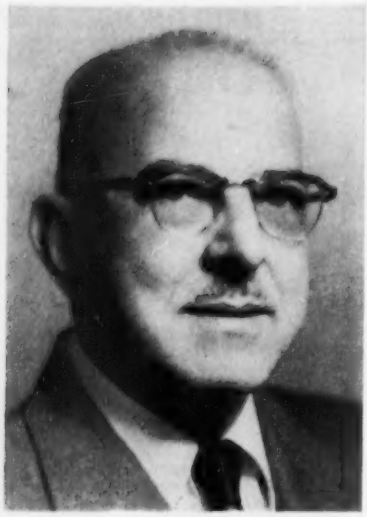
R. C. WALDIE
. . . Williams & Co. v. p.-sales

Williams & Co. Inc., Pittsburgh, elected **R. C. Waldie** vice president in charge of sales, **J. H. Penske Jr.** vice president and Cleveland district manager, **W. P. Dettwiler** vice president and Cincinnati district manager, **W. H. Kauffman** manager of the welding department, **D. F. Buttermore** manager of the safety department and **G. J. Cross** supervisor of fire equipment sales and assistant to Mr. Buttermore in the safety department.

Following resignation of **Joseph H. Carter** as chairman of the board of **Pittsburgh Steel Co.**, Pittsburgh, **Avery C. Adams** assumes the duties of chairman in his capacity as president of the company. **Allison R. Maxwell Jr.**, vice president-sales, was elected to the board. Mr. Carter remains with the company as a consultant.

Babcock & Wilcox Co. elected **M. Nielsen**, vice president, to the board of directors and placed him in charge of its boiler division at Canton, O., to succeed the late **J. H. King**. Also at the boiler division **W. D. Sullivan** was placed in charge of the manufacturing department and elected a vice president, and **J. P. Craven** was made superintendent of the erection department.

John A. Gilbreath, former assistant vice president of Servel Inc.,



WALLACE L. HOWE
. . . new vice president of Norton Co.

CARL F. SCHULTZ
. . . sales mgr., Motor Wheel Corp. div.

R. E. FISHER
. . . Eaton Mfg. v. p.-sales

was named division manager of **Westinghouse Electric Corp.'s** new air conditioning division which will be located at Staunton, Va., site of a new Westinghouse plant scheduled for completion in June.

Norton Co., Worcester, Mass., elected **Wallace L. Howe** vice president in charge of research and development and a director. **John M. Cook,** vice president and general sales manager of Behr-Manning Division, also was elected a director. **Henry M. Elliot,** first vice president of Behr-Manning, has retired as a Norton director.

William T. Kiehl Jr., general manager, Pittsburgh-DuBois Division, **Rockwell Mfg. Co.**, was named assistant to the executive vice president with headquarters in Pittsburgh. Succeeding him as general manager is **W. M. Connor,** former general manager of the company's Macnick Division at Tulsa, Okla. **Earl Hudson,** production manager at DuBois, was named assistant general manager of that division.

John Billie was appointed sales manager for Plasteel roofing and siding products of **Plasteel Products Corp.**, Pittsburgh.

Carl F. Schultz was made sales manager, pressed steel division, **Motor Wheel Corp.**, Lansing, Mich., to replace **Lee Benner,** retired. Mr. Schultz joined the firm in 1953 as a sales representative in the division and prior to that was sales manager of Pressed Metals of America Inc.

Eugene F. Anderson was made district manager of the New York and New England territory of Pittsburgh Crucible Division, **Crucible Steel Co. of America.** In this territory he will supervise sale of constructional alloy steels produced at the firm's Midland, Pa., Works. He will have headquarters in New York. **W. E. Burlingame,** retiring New York-New England district manager, remains with the company on special sales assignments.

R. E. Fisher was elected vice president in charge of sales for **Eaton Mfg. Co.**, Cleveland. **R. H. Daisley,** formerly vice president-manufacturing, becomes administrative vice president in charge of Eaton plants in Ohio, Kenosha, Wis., and London, Ont. **F. H. Mott,** since 1947 general manager of the pump division in Detroit, was made administrative vice president in charge of plant operations in Michigan.

Carl D. Bowers was made assistant director of safety, **Kaiser Steel Corp.**, Fontana, Calif., works. **E. W. Holbrook,** formerly superintendent of stores, was appointed assistant to the purchasing agent. He is succeeded by **Merton E. Wade.**

Robert H. Groman, divisional sales manager for **Eutectic Welding Alloys Corp.**, Flushing, N. Y., was promoted to director of applied welding engineering. He succeeds **Helmut Thielsch.**

William J. Athanson was appointed vice president in charge of automotive sales for **National Automotive Fibres Inc.**, Detroit. He was formerly with Briggs Mfg. Co.

William A. Callison, vice president-eastern sales, was named vice president in charge of customer relations for all product divisions of **American Locomotive Co.**, New York. **William F. Lewis,** vice president-western sales, is now vice president in charge of marketing. **Arthur T. Lawrance,** southwest regional sales manager, Alco Products Division, was named general manager of field sales for all products of the company.

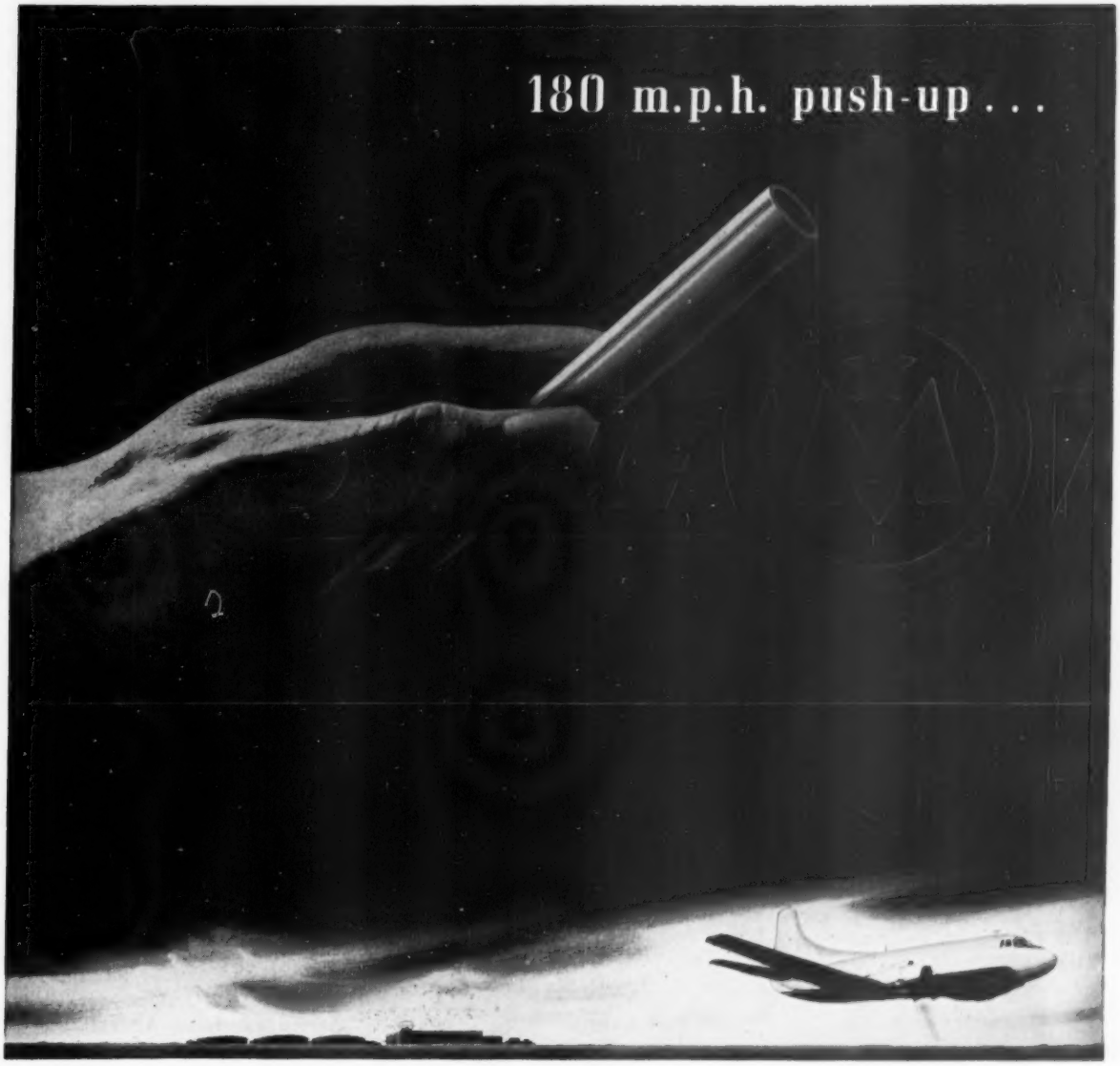
Grav-i-Flo Corp. appointed **Eugene N. Jarvis,** Detroit, as factory sales and service representative in the southeastern Michigan area.

Albert M. Olson, secretary-treasurer, **Standard Forgings Corp.**, Chicago, was elected a director to succeed the late **Arthur F. Reum. Robert D. Curley** was appointed assistant vice president of sales.

Edward E. Hill was named chief inspector of **Worcester Pressed Steel Co.**, Worcester, Mass. He succeeds **Carl O. Johnson,** retired.

Thomas R. Hazel was made supervisor, tractor equipment engineering division, **Hyster Co.**, Portland, Oreg., and **Ronald A. Johnson** was made supervisor, engineering standards division.

The export division of **American Brake Shoe Co.**, New York, appointed **Harold C. Osborne** manager



Any time you fly in a Martin 4-0-4, Superior tubing is probably working for your safety.

Once you're airborne, watch the 840-pound main landing gear assemblies flip forward and up with amazing speed, even though they may be working against a 180 m.p.h. drag. Fast landing gear retraction gives you an extra margin of take-off safety because "clean" aircraft have better flight characteristics.

Chances are your Martin 4-0-4 contains many feet of Superior ½" stainless steel tubing. In the hydraulic system, this tubing operates at a pressure of 3000 p.s.i., normally. On Martin's torture racks, it has demonstrated remarkable endurance under violent pressure surges at 1000 cycles *per second*, even around minimum bends.

Performance like this may well have a bearing on your production problems as well as on your personal safety. Superior's long experience in fine tubing, backed by highly-developed production equipment and extensive research and testing facilities assures you of top-quality small tubing for doing tough jobs well. Outline your own production problems in a letter to us, right now—we'll send you complete information and the appropriate Data Memo by return mail. Address: Superior Tube Company, 2005 Germantown Ave., Norristown, Pennsylvania.

Round and Shaped Tubing available in Carbon, Alloy, and Stainless Steels, Nickel Alloys and Beryllium Copper.

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All analyses .010" to ⅝" O.D.
Certain analyses (.0?*" Max. wall) up to 1⅜" O.D.

of industrial equipment sales, **Robert Beecken** manager of railway product sales and **Franklin M. Simpson** manager of automotive equipment sales.

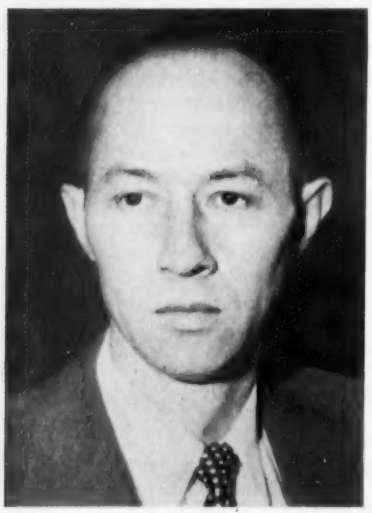
Glenn J. Gibson was appointed to the engineering staff of **Cooper Alloy Foundry Co.**, Hillside, N. J. He will direct a research program aimed at developing methods for welding of corrosion-resistant and heat-resistant alloys. For the last nine years he has been a research engineer with Air Reduction Co. Inc.

A. M. Lowrey was appointed assistant general sales manager, western division branches, **Quaker Rubber Corp.**, division of H. K. Porter Co. Inc. at Philadelphia. Mr. Lowrey was assistant manager, mechanical goods division.

J. L. Pringle was made assistant to the general superintendent of the San Francisco yard, shipbuilding division, **Bethlehem Pacific Coast Steel Corp.**, advancing from marine salesman.

Gustave T. Schushan was elected a vice president and general manager of **Taber Pump Co.**, Buffalo. He was assistant general manager and head of the engineering department.

G. D. Craig Jr. joined **Northwestern Electric Co.**, Chicago, as general sales manager. He was eastern distric sales manager for Jack & Heintz Inc. at New York.



G. D. CRAIG JR.
. . . joins Northwestern Electric Co.

H. E. ELLIOTT
. . . Watson-Stillman sales mgr.

H. E. Elliott was made sales manager, **Watson-Stillman Co.**, Roselle, N. J., a division of H. K. Porter Co. Inc. **R. W. Schreck** was made assistant sales manager specializing in plastics machinery sales.

Edwin Burke, formerly of United Engineering & Foundry Co., was appointed project engineer at the Midland, Pa., Works of **Crucible Steel Co. of America.**

Joseph A. Bogan was appointed director of public relations of Le Roi Co.'s **Cleveland Rock Drill Division**, Cleveland. He was formerly with Bituminous Coal Research Inc.

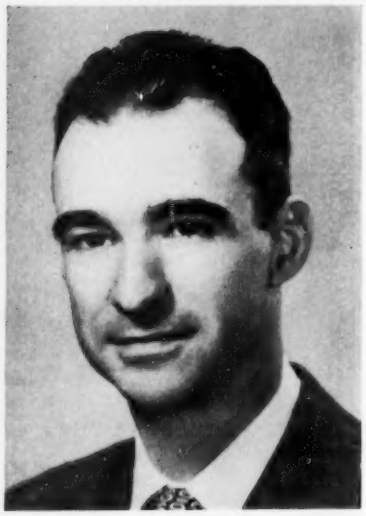
John M. Davidson was appointed assistant sales manager, metal processing department, **Pennsylvania Salt Mfg. Co.**, Philadelphia.

Oliver E. Mount, secretary and treasurer of **American Steel Foundries**, Chicago, retired after over 37 years of service. **Carter R. Lines** becomes treasurer, **Orrin B. Garner** will be secretary and **Lester T. Moate** controller.

George W. Alexander was named assistant to the operations manager of **Dravo Corp.'s** engineering works division, Pittsburgh.

Thomas Hamilton was appointed a salesman in the Detroit area for **Clearing Machine Corp.**

Kenneth A. Hawkins was made Chicago branch sales manager for **E. F. Hauserman Co.**



F. B. PINZEL
. . . Buffalo Steel Div. gen. sales mgr.

F. B. Pinzel was appointed general sales manager of H. K. Porter Co. Inc.'s **Buffalo Steel Division**, Tonawanda, N. Y. He formerly served as assistant general sales manager at Buffalo.

Organizational changes in the tool division at **Goodyear Aircraft Corp.**, Akron, resulted in appointment of **Adam B. Cribbs** as manager for tool engineering and **James S. Nielsen** as manager for tool manufacture. **M. Martin Pflug** was named manager of tool planning and processing and **Robert J. French** was assigned duties as manager of tool design. Mr. Cribbs joined Goodyear Aircraft Jan. 1. He was formerly with the LaPorte, Ind., aircraft division of Whirlpool Corp. and has more than 20 years of experience in tool design, manufacture and engineering.

Glen Harmon, assistant chief engineer, was promoted by **Colonial Broach Co.**, Detroit, to new top-level engineering duties, and **Earl Clark** was appointed a Detroit area sales representative.

Promotions at the Ashland, Ky., division of **Armco Steel Corp.** include **Lambert A. Salender**, named superintendent of the newly formed strip pickling and cold reduction department; **John D. Patterson** named to succeed Mr. Salender as superintendent, east processing department; **Hillard E. Miller** as superintendent, west processing department; **H. Claire Rutledge** as

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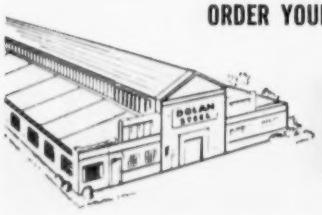

DOLAN *Steel Company Inc.*

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PHONE 5-8173

HENRY L. LUNGER
. . . a Republic Rubber Div. sales mgr.

HERBERT HILDEBRAND
. . . sales mgr., U.S.P. materials handling

FREDERICK E. MUNSCHAUER JR.
. . . Niagara Machine & Tool v. p.

superintendent, shipping department; and **Lewis K. Edwards** as works industrial engineer.

Henry L. Lunger was appointed manager, automotive and appliance sales and **James M. Hughes** manager, distributor sales for **Republic Rubber Division,** Lee Rubber & Tire Corp., Youngstown. Mr. Lunger has been with Republic in Youngstown and Chicago for the last 18 years. Since 1946 he has been in charge of inside sales on automotive and appliance products.

Ernest W. Rothaar was appointed to the staff of C. J. Snyder, **Chrysler Corp.** vice president and operating manager. Mr. Rothaar will be responsible for automotive body cost and design analysis and body plant automation for the corporation. He was formerly master mechanic of Chrysler's automotive body division.

Gaylord W. Brown is now manager of the Duncansville, Pa., plant of **National Radiator Co.**

Herbert Hildebrand was appointed sales manager for **Union Steel Products Co.'s** materials handling equipment division, Albion, Mich. He formerly served as the firm's Washington representative. He succeeds **Charles F. Clark,** now sales manager for the company's line of hardware and consumer products.

Charles V. Grimm was appointed assistant purchasing agent of **Pollak Steel Co.,** Cincinnati.

Lyle F. Gulley was appointed works manager of **Granite City Steel Co.,** Granite City, Ill.

Detroit Stamping Co., Detroit, appointed **John M. Thullen** purchasing agent and **Sam D. McIlwain** a product engineer.

Ray C. Reinhartsen, vice president and sales manager, **Onsrud Machine Works,** Chicago, was named executive vice president and general manager. **George M. Campbell,** secretary, was made a vice president.

Frederick E. Munschauer Jr. was elected to the new office of vice president in charge of manufacturing and industrial relations at **Niagara Machine & Tool Works,** Buffalo. He continues as works manager, a position he has held since 1946. He also serves as a director of the company.

R. G. Ellis was promoted to assistant chief engineer, **Micromatic Hone Corp.,** Detroit.

Ohio Steel Foundry Co., Lima, O., appointed **George D. Griffiths** manager and **Charles L. Flanigan** assistant manager of roll sales.

Boniface Miller resigned as superintendent of foundries, **Baldwin-Lima-Hamilton Corp.,** to become vice president and superintendent of **Crown Nonferrous Foundries,** Chester, Pa.

G. J. Dekker succeeds **S. H. Smith,** retired, as district manager of **Air Reduction Sales Co.'s** Milwaukee office. Mr. Dekker was formerly St. Louis district manager.

OBITUARIES...

S. M. Rust Sr., 72, board chairman, **Rust Engineering Co.,** Pittsburgh, died Jan. 29.

B. Wilson Bird, manager of **Atlantic Steel Co.'s** fabricating division at Atlanta, died Jan. 24.

Dr. Karl B. McEachron, 64, **General Electric Co.** scientist known for his pioneering work on man-made lightning and high voltage phenomena, died Jan. 24 in Pittsfield, Mass.

George A. Peabody, 76, identified for the last half century as an executive of **Cleveland Frog & Crossing Co.,** Cleveland, died Jan. 27.

Martin L. Sloan, 66, former vice president and general manager of **General Electric Co.'s** lamp division, Cleveland, died in Los Altas, Calif., Jan. 17.

Frederick L. Woods, 50, president, **Lakeside Foundry Ltd.,** Pt. Colborne, Ont., died Jan. 21.

John F. Coakley, 57, assistant to the head of the tool and die department of **Pressed Steel Tank Co.,** Milwaukee, died Jan. 22.

Eaton Buys Patent Rights

Acquisition is expected to heighten interest in electromagnetic power transmission

EATON MFG. CO., Cleveland, holder of patent rights covering an advanced principle of electromagnetic clutching, braking and power transmission using a magnetizable powdered metal and dry lubricant mixture, bought foreign rights to the Jacob Rabinow patents which also have a basic application in this field. The patents of Jacob Rabinow, National Bureau of Standards, Washington, cover certain aspects of the principle of using powdered iron as a magnetic medium.

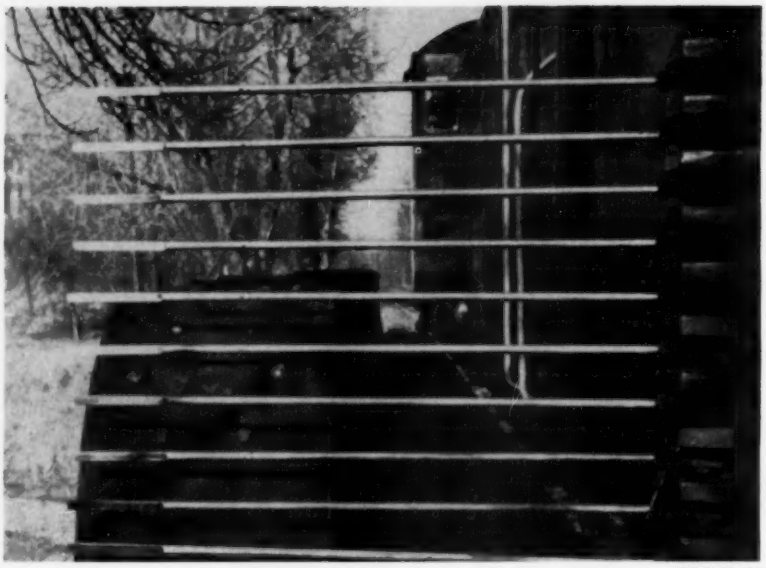
Following many years in which Eaton has done a large part of the development work in making this device practical from an industrial and production standpoint, the announcement is expected to heighten the interest of world industry in electromagnetic power transmission. Acquisition of the Rabinow patents rounds out Eaton's patent coverage in this field.

Coverage—The electromagnetic principle, as covered by a group of Eaton patents, applies to the use of powdered magnetizable metal in a mixture with dry powdered additives in a clutch, brake, transmission or similar assembly. By means of a magnet coil and complete magnetic circuit, the fine metal particles and dry additives and lubricants are magnetized—drawn together in a strong transmitting bond when magnetizing control current is applied. The mixture is literally "frozen" or "unfrozen" in direct proportion to the amount of current applied.

Applicable in automotive and aircraft manufacturing and in paper, textile, machine tool, home appliance and other fields, this device can be built in a broad range of capacities.

Maryland Bolt & Nut Expands

Maryland Bolt & Nut Co., Baltimore, is installing an additional furnace and several of the latest type bolt and nut machines. C. S. Duvall is president. The company is an affiliate of the American Chain & Cable Co. Inc., Bridgeport, Conn.



Wide World

Clearance Within a "Cat's Whisker"

Clearance of shipments on the Pennsylvania Railroad can be determined to within a "cat's whisker" through data gathered by the clearance car above. In addition to the overhead and side "feelers," the car has "right foot" and "left foot" templates to measure structures as this girder on an overhead bridge

Kennametal Building Plant

Kennametal Inc., Latrobe, Pa., awarded a contract for the construction of a manufacturing plant and office building at 10201 Capital Ave., Oak Park, Mich. The plant will produce tungsten carbide tools and specialties. The plant, together with the necessary stock and equipment, will be completed Apr. 1.

Elected by Association

Walter W. Walb, president of American Steel Dredge Co. Inc., Ft. Wayne, Ind., was elected vice president of Power Crane & Shovel Association, New York.

Rollway Bearing Moves Branch

Philadelphia sales office of Rollway Bearing Co. Inc., Syracuse, N. Y., moved to 3701 N. Broad St. William B. Allison, engineering representative, is in charge.

Research Firm Is Organized

ProToCorp Inc. was organized by Dr. Edward Bentley in Waltham, Mass. It will engage in industrial research and development. The organization will seek solution of problems in instrumentation, subminiaturization and many other fields of physics and engineering.

Ladish Buys Machine Firm

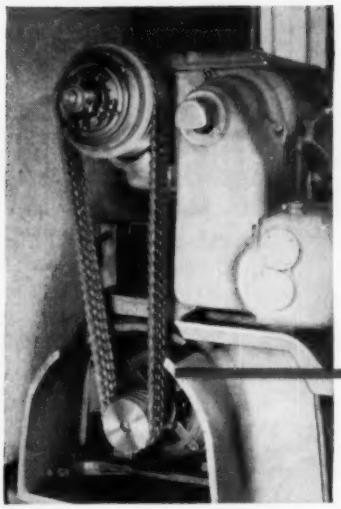
Ladish Co., Cudahy, Wis., producer of fittings and forgings, bought Tri-Clover Machine Co., Kenosha, Wis., maker of stainless steel fittings for the food and drug industries; valves and pumps. The firm is being operated as the Tri-Clover Sanitary Division of Ladish Co.

Engineering Firm Names Agents

Vacuum-Electronic Engineering Co., New Hyde Park, Long Island, N. Y., appointed as its representatives in their respective territories Measurement Engineering Ltd., Arnprior, Ont.; E. W. Averill & Co., Detroit; and Carl Hermann, Palo Alto, Calif.

Machinery Firm Changes Hands

Metals Disintegrating Co. Inc., Elizabeth, N. J., will purchase all of the outstanding stock of Pulverizing Machinery Co., Summit, N. J., effective on or before Feb. 28. The latter company makes grinding ma-



Performance Proves

20% to 90%

LESS VIBRATION

with Veelos—the Balanced V-belt

Engineers have long known that there are four principal causes of machine vibration: 1. bearings; 2. motor; 3. clutch; 4. sheaves. Often overlooked is a fifth cause: v-belts. And, in many instances, *v-belts alone* are the major cause of vibration.

There's a logical reason for this.

Regular v-belts have spots of varying density due to their construction. Normally, these spots are not apparent, yet they throw the belt out of balance when the drive is operating. As a result, vibration is created that can damage bearings, shafts and, most important, the finished work.

This is not true of Veelos v-belts.

Veelos is absolutely uniform throughout its entire length. Every link and every stud is identical. The smooth, machine-cut sides and the laminated construction assure smooth, vibrationless power delivery. Veelos is perfectly balanced.

In case after case, installation of Veelos v-belts has reduced machine vibration 20% to 90%.

Proof that Veelos will reduce vibration can easily be demonstrated with an electronic vibration analyser. This analyser measures amplitude of vibration to as low as 2-millionths of an inch.

Fifteen minutes of your time is all that is required to show you with the electronic analyser that Veelos creates less machine vibration. Drop us a line or clip the coupon for a demonstration.

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Yes, I would like a demonstration. **Have your representative call me for a convenient time.**

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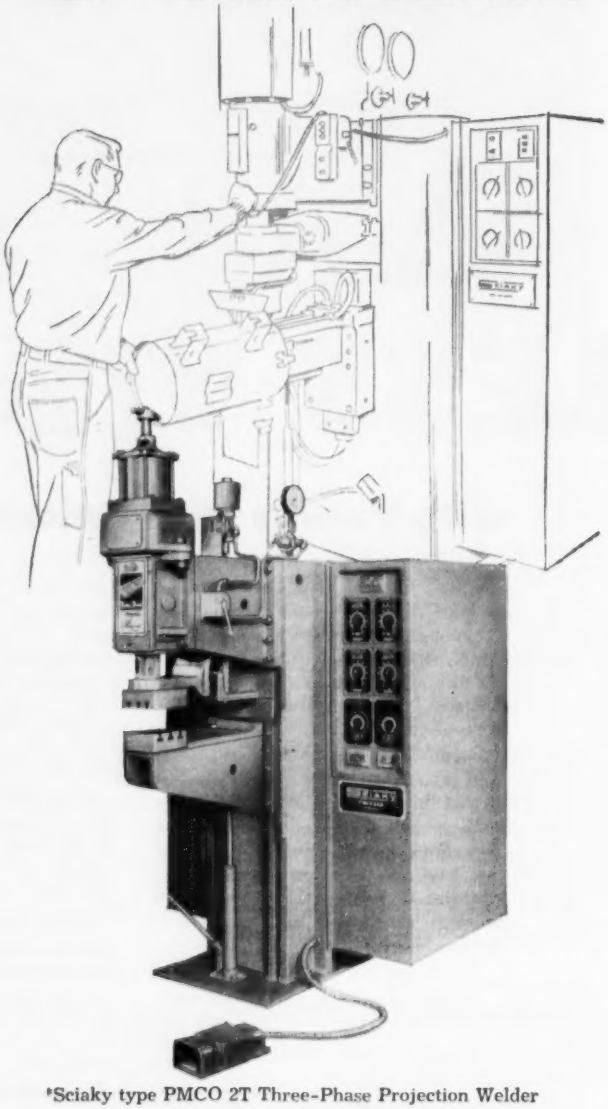
ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Veelos is known as Veelink outside the United States.

SEVEN DIFFERENT PRODUCTION OPERATIONS ON ONE STANDARD WELDER



Versatile Sciaky Standard Three-Phase Projection Welder Sharply Reduces Tooling Costs

With typical efficiency, Moloney Electric Company uses a minimum number of Sciaky machines for a maximum number of welding operations.

After careful study, Moloney found Sciaky electric resistance welding offered many advantages over other methods of fabrication. Sciaky patented Three-Phase principle of operation provided automatic compensation for variation in material thickness, piece-part configuration, and fit-up to improve weld quality and machine versatility.

Only Sciaky Three-Phase characteristics of balanced line load, high power factor, and 75% current reduction permitted such extensive use of resistance welding with existing power supply.

Now Moloney pressure-tight transformer tanks, from 10" to 30" in diameter, and 21" to 54" in height, are fabricated almost completely on Sciaky Three-Phase welders.

For complete details on the efficiency and economy of Sciaky resistance welding at Moloney, write for "Resistance Welding at Work", Volume 3, No. 7.

*Sciaky type PMCO 2T Three-Phase Projection Welder joins seven different parts to Moloney Transformer Tanks. A two-switch foot pedal provides immediate selection of preset heat and pressure sequences for different welds without removing tank from welder or stopping production to reset controls.

Largest Manufacturers of Electric Resistance Welding Machines in the World

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chinery, dust collectors and conveying systems. Main products of Metals Disintegrating Co. are powdered metals, metallic pigments and metal abrasives.

Furnacemaker Enlarges Plant

Heating Specialties Co. Inc., Arbutus, Md., manufacturer of oil and gas-fired warm-air furnaces and oil burners, is constructing an 8000-sq-ft plant addition. F. M. Wilhelm Sr. is president.

Columbia Completes Project

Columbia Steel & Shafting Co., Pittsburgh, completed its $500,000 modernization and expansion program. Improvements were widespread and included installation of three new Medart turning machines and automatic feed tables in the bar mill, nearly doubling the company's previous production capacity in 1½ in. to 6½ in. diameter turned and polished bars. A 3-in. bar shear is in operation, replacing two machines of lesser capacity. Two large overhead cranes were installed in areas where hand-operated hoists formerly were used. Old acid tubs were replaced with mechanized acid pickling tanks. More power and heat to handle the increased requirements of the new equipment were provided.

Goodman Buys Equipment Line

Goodman Mfg. Co., maker of mining machinery, acquired the line of crushing, screening and handling equipment of Diamond Iron Works, Minneapolis. Diamond's operations will be moved to Goodman's main plant at 4834 S. Halsted, Chicago, and will be known as Diamond Iron Works Division.

Engineering Firm Moves

Efficient Engineering Co. Inc. moved its main office and production engineering offices to 21680 Coolidge Highway, Detroit 37.

Forms Development Department

Metal Hydrides Inc., Beverly, Mass., producer of metallurgical hydrides, chemical hydrides, metal powders and alloy powders, organized a metallurgical development department, headed by Emanuel Gordon.

Hahn Buys Distributorship

Charles Hahn Jr. purchased all of the outstanding capital stock of R. C. Neal Co. Inc., Buffalo, distributor of tools, machinery and industrial supplies.

Belknap Mfg. Changes Hands

Belknap Mfg. Co., Bridgeport, Conn., has been purchased by Detroit Controls Corp., a division of American Radiator & Standard Sanitary Corp. Belknap makes bronze valves, fittings and special bronze castings. It will be operated as a subsidiary under its present name; no major changes in operating policies or personnel are planned.

Marshall Steel Expands Plant

Marshall Steel Co., La Grange, Ill., maker of tool steel ground flat stock, completed a plant addition and installation of much new equipment.

O'Keefe Heads Chicago Group

Raymond T. O'Keefe Jr., vice president and director of Kropp Forge Co., Chicago, was elected president of Cicero (Ill.) Manufacturers Association, that city. He succeeded John E. Walsh Jr., vice president of Midland Pipe & Supply Co., Chicago, to the post.

Permutit Building Plant

Permutit Co., New York, maker of industrial and commercial water conditioning equipment and ion exchange resins, is building a metalworking plant at Lancaster, Pa. The $750,000-plant is scheduled for completion by this spring. The firm will vacate its Brooklyn, N. Y., plant and transfer its equipment, augmented by new production apparatus, to the new location. Later, the manufacture of Simplex Valve & Meter Co. products, now produced in Philadelphia, will be transferred to Lancaster. Neither the main executive office nor the manufacturing plant at Birmingham, N. J., will be affected by the expansion move.

Reynolds Opens Plant

New aluminum reduction facility lifts firm's annual capacity to 829 million pounds

REYNOLDS METALS CO., Louisville, has placed its Robert P. Patterson aluminum reduction plant, located near Arkadelphia, Ark., in operation. The plant has an annual rated capacity of 110 million pounds of virgin aluminum, giving

J. W. HUTCHISON
. . . Patterson plant manager

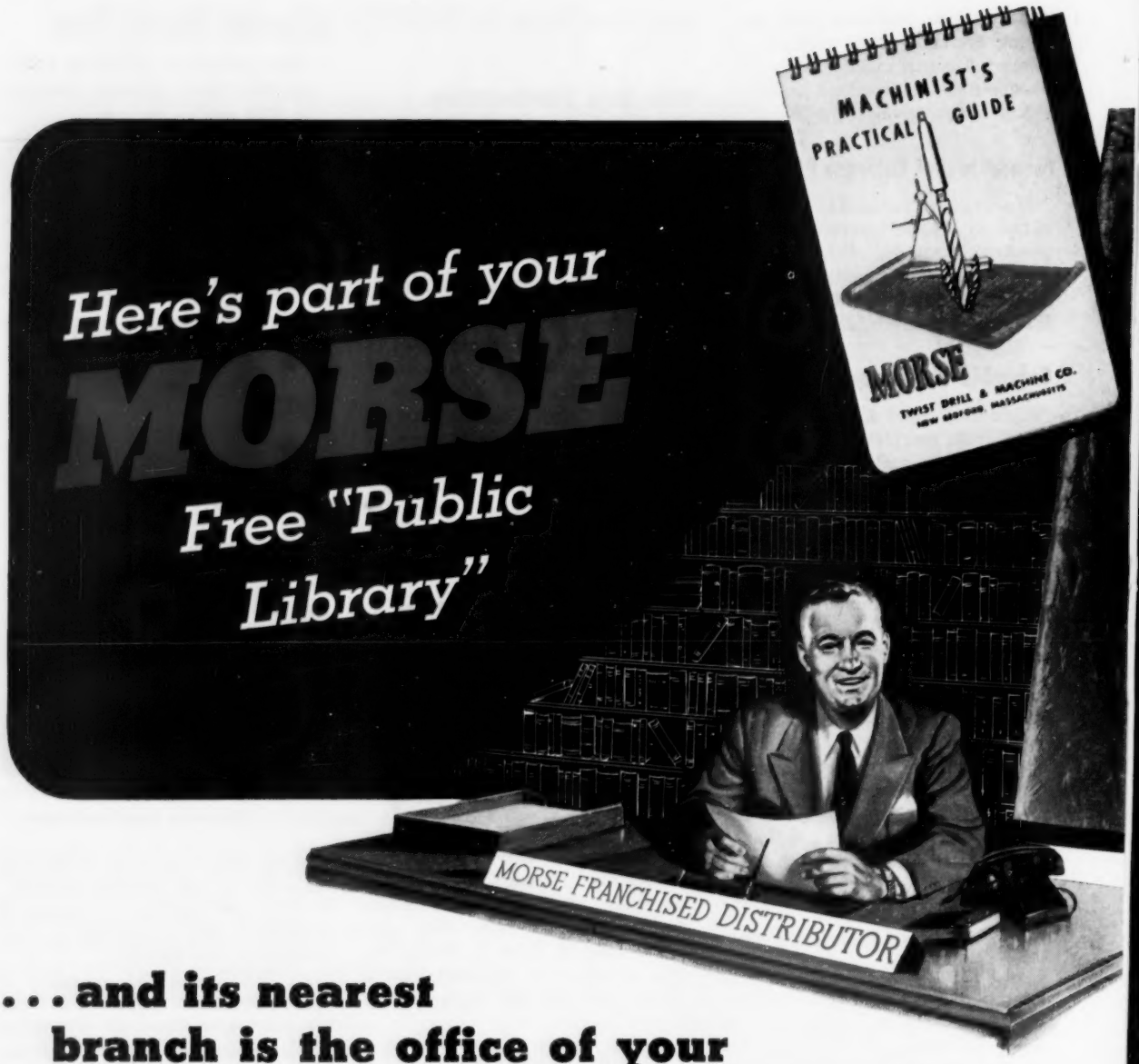
the company an annual production capacity of 829 million pounds.

The new facility is named in honor of the late company vice president and director.

J. W. Hutchison is manager of the $34-million plant. The "pot rooms," where metallic aluminum is produced, are 1827 ft long. Accessory operations include a general administrative office, laboratory, carbon electrode plant, auto storage facilities, steam plant and other structures.

Opening of the Patterson plant marks continued Reynolds expansion in Arkansas and is another important milestone in the aluminum industry's general expansion program. Reynolds Metals Co. operates another reduction plant in the state—the Jones Mills facility, located in the northern end of Hot Spring county. Alumina, which is converted into metallic aluminum at the reduction plants, is supplied by Reynolds' alumina plant at Hurricane Creek, while the basic alu-

(Please Turn to Page 102)



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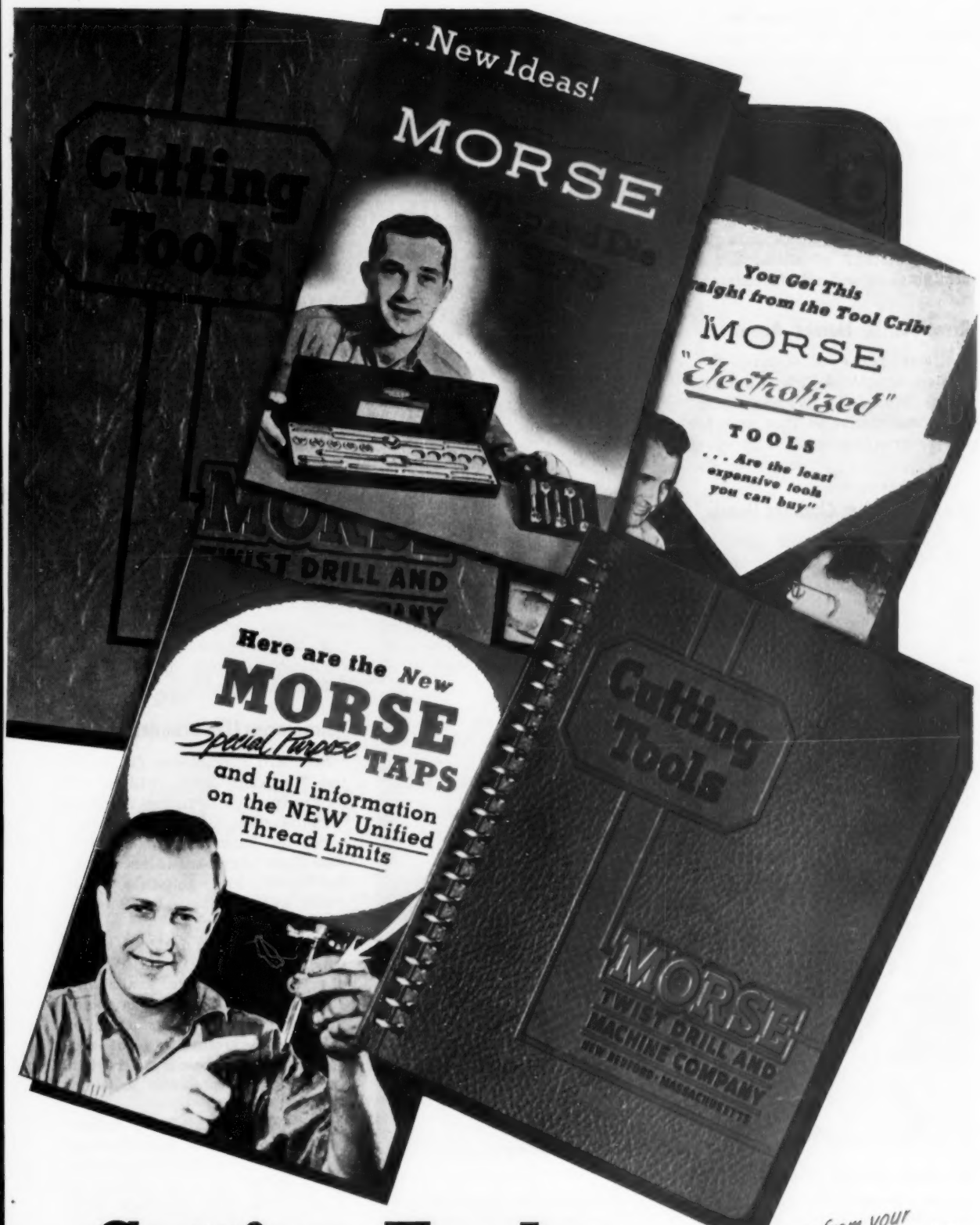


Cutting Tools

Buy them by phone from your Morse-Franchised Distributor and save ordering time

(*Continued from Page 99*)
minum ore (bauxite) is mined by a subsidiary firm, Reynolds Mining Co., near Bauxite, Ark.

Mettler Machine Moves Office

Mettler Machine Tool Inc., New Haven, Conn., moved its New York sales office to 11 Broadway. S. Straus, president of Artys Sales Co., is conducting and managing sales promotion of Mettler's wire straightening and cut-off machines.

Rivett Lathe Names Agent

Rivett Lathe & Grinder Inc., Boston, appointed Ficke Engineering & Supply Co., Wichita, Kans., as representative in that area for its power units, valves and cylinders.

Mosebach Firm Changes Hands

Harold J. Evans and Ralph M. Nadler purchased all outstanding stock of Mosebach Electric & Supply Co., Pittsburgh, manufacturer and distributor for the mining industry. The company is expanding its facilities to serve mills, railroads, utilities and other industries. Mosebach products include industrial resistors, choke coils, resistance heaters, resistance welders, rail bonds, railroad signal bonds, trolley line materials, bronze bushings and mining machinery replacement parts.

Joe-D Buff Co. Formed

Joe-D Buff Co. was organized in Sandwich, Ill., combining the assets and interests of Joseph R. Davies & Associates and Dearborn Industrial Mfg. Co., both of Chicago. The company produces sisal buffs and polishing wheels for metal finishing purposes.

Goodwin Heads Distributors

Paul Goodwin of Eastern Steel & Metal Co., West Haven, Conn., was elected president of Association of Steel Distributors Inc., New York. He succeeded J. I. Baron of Baron Steel Co., Toledo, O. Other officers are William Fabrikant, Fabrikant Steel Products Inc., New York, vice president; Herman Williams, Williams Steel & Supply Co., Milwaukee, vice president; Leo Goldner, Baron Steel Co., Toledo, secretary; Walter Ising, Laube Steel Co., Chicago, treasurer.

Columbia Buys Two Steamers

Columbia Transportation Co., Cleveland, purchased the steamers *R. J. Paisley* and *Ben E. Tate* from J. A. Paisley Steamship Co., that city. These two self unloading vessels engage primarily in the carrying of coal, stone and sand on the Great Lakes. The Columbia fleet now consists of 22 vessels.

Victor Equipment Expands

Victor Equipment Co., San Francisco, manufacturer of metal cutting and welding equipment, purchased a substantial interest in J. C. Menzies & Co., Chicago. The latter company specializes in distribution of welding equipment, hardfacing alloy rods and application engineering.

Recently, Victor acquired Adams Alloy Co., Wakita, Okla., and is negotiating for a tract of land in Los Angeles to take care of the future expansion of its Alloy Rod & Metal Division.

A Back-Road Hauling Feat

A year's preparations by the Cleveland Cartage Co. went into the moving of two king-size 172,000-pound transformers for the Cleveland Electric Illuminating Co. The "truck-train" at times numbered six vehicles to provide motive and braking power for the 11-mile trip over rural roads. Two auxiliary bridges had to be built over old-type spans, and steel reinforcing sections were placed over culverts for their protection. The weight of the 208,000-pound tractor and tandem-carryall was distributed among 34 wheels to meet road limit requirements

Refractories Line Broadened

Seaboard Refractories Co., Raritan Township, N. J., will devote its entire manufacturing facilities to production of special refractories for Babcock & Wilcox Co., New York. Seaboard is discontinuing its own sales activities, all of which will be handled by Babcock & Wilcox.

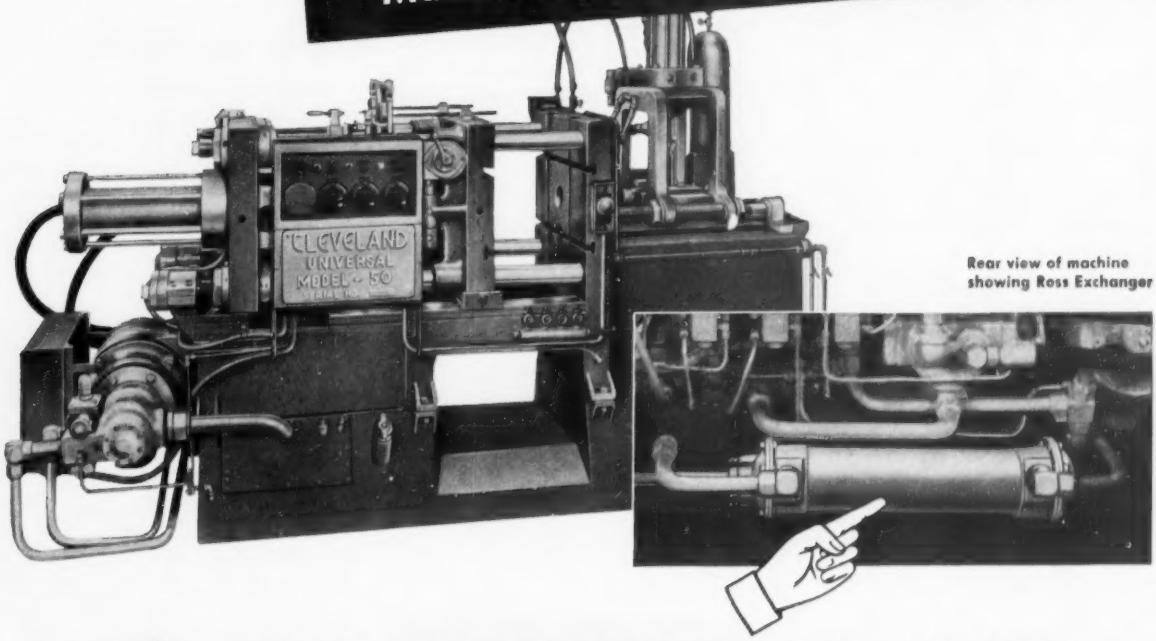
This program is designed to expand and diversify the B&W line of refractory products. Availability of the Seaboard facilities may point the way to future production of custom-made refractories of special refractory bases other than those products presently made by B&W.

Babcock & Wilcox Co.'s Refractories Division now manufactures and markets special refractories made of Kaolin and electrically-fused mullite base materials. Firebrick, insulating firebrick and an extensive line of castables, plastics and mortars are manufactured at its Augusta, plant.

Seaboard specializes in custom-

OIL TEMPERATURE REMAINS CONSTANT

while this Cleveland Die Casting Machine cycles 1000 shots per hour



Rear view of machine showing Ross Exchanger

IT'S ROSS EXCHANGER EQUIPPED

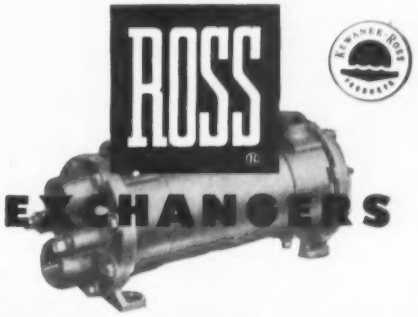
With a locking pressure of 50 tons, this Cleveland Model 50 Universal Die Casting Machine has been designed to cycle over 1000 times per hour. To prevent excessive fluctuations in oil temperature, which would tend to cause variations in hydraulic performance, a Ross Type BCF Exchanger has been installed. The full 44.2 gpm capacity of the machine's high pressure, two-stage pump is thus insured!

Says The Cleveland Automatic Machine Company: "Ross Exchangers have done a fine job on Cleveland Die Casting Machines. We have standardized on the Ross Exchanger for our Model 50, because it is compact and we need this space-saving feature especially on this small size machine."

Regularly selected by leading manufacturers of numerous types of major equipment for their high thermal efficiency, Ross Exchangers are ruggedly built to withstand punishing hydraulic shock. Tough, ductile seamless copper shells and brass forgings can well absorb the extra load.

Pre-engineered and fully standardized in a wide range of sizes, Ross Type BCF Exchangers are available with "off-the-shelf" promptness to meet most needs. For detailed information, request Bulletin 1.1K5.

KEWANEE-ROSS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
1431 WEST AVENUE • BUFFALO 13, N. Y.
In Canada: Kewanee-Ross of Canada Limited, Toronto 5, Ont.



Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

made shapes of silicon carbide, mullite-sillimanite and fireclay base materials. The firm also makes refractory mortars, castables and ramming mixes of these base materials.

Consolidation Is Approved

Consolidation of American Metal Products Co., Detroit, and Tube Reducing Corp., Wallington, N. J., became effective upon approval by stockholders. Frederick C. Matthaei Sr. will continue as president of American Metal; John D. Judge is president of Tube Reducing which will continue its regular operation as wholly owned subsidiary. Manufacture of Tube Reducing's products will be started in Detroit soon. Present plans also call for installation of facilities to produce its products on the West Coast.

Presto To Shift Operations

Entire civilian production of National Presto Industries Inc. will be transferred this spring from Eau Claire, Wis., to Jackson, Miss., where a $1.5-million plant is being erected. The company makes pressure cookers and canners, steam irons, electric deep fryers, coffeemakers and outboard motors.

The company's Eau Claire factories will be devoted to defense work, including production of 105 mm shells. The company's plant at Menomonie, Wis., is producing 90 mm shell cases.

Westinghouse Expanding Plant

More than $2.5 million will be spent this year to rearrange and expand Westinghouse Electric Corp.'s Electric Appliance Division plant in Mansfield, O. This is the first step in a program to approximately double production of several major appliances and substantially increase production of portable appliances.

"Over $2 million worth of the expenditure will be for new equipment," says J. H. Ashbaugh, vice president, "much of which will be used to replace machinery now being shipped to our new plant in Columbus, O. Other new equipment and some old equipment which will be shifted and placed in a new addition to the plant, providing an additional 34,000 sq ft of working area."

Opens Los Angeles Office

Electric Controller & Mfg. Co., Cleveland, opened a sales and engineering office at 6066 E. Olympic Blvd., Los Angeles 22, with John R. Woodruff as Pacific Coast district manager.

Hoist Firm Appoints Agent

Gar Wood Industries Inc.'s St. Paul Hydraulic Hoist Division, Minneapolis, appointed Chicago Hoist & Body Co., Chicago, as its distributor in that territory.

Equipmentmaker Buys Plant

Cincinnati Cleaning & Finishing Machinery Co. maker of industrial cleaning, washing, paint finishing and baking equipment, acquired a plant in Sharonville, O. The plant contains the company's offices, engineering and estimating functions and manufacturing facilities. In addition, the company operates two plants in Ironton, O., and now has a total of 60,000 sq ft of plant floor space. Facilities of the new plant will be concentrated on manufacture of specially designed finishing equipment.

Heads Furnace Association

L. H. Gillette, manager, industrial heating sales, Westinghouse Electric Corp., Pittsburgh, was elected president of Industrial Furnace Manufacturers Association Inc., Washington, at the annual meeting Jan. 25-26. He succeeds Curt H. Vaughan, sales manager, Electric Furnace Co., Salem, O.

Majestic Enters New Field

Majestic Major Appliance Corp., subsidiary of Wilcox-Gay Corp., Brooklyn, N. Y., entered the room air-conditioning field. The firm is offering a fully automatic unit featuring Timeset clock control.

Goss Operating New Plant

Goss Printing Press Co. is carrying on all of its operations in its new plant on W. 31st street and S. Central avenue, Chicago 50. The manufacturing area contains 368,000 sq ft; the offices, 49,420 sq ft. The building investment represents about $5,250,000.

NEC Makes Appointments

Wallace Dickson was appointed administrative assistant in charge of planning and developing activities of New England Council, Boston. Richard E. Fiske is the news director for the council while Paul V. McNulty was named editor of the *New Englander*, the council's monthly magazine.

Forms Parkersburg-Aetna Corp.

Merger of Parkersburg Rig & Reel Co., Parkersburg, W. Va., and Aetna Ball & Roller Bearing Co., Chicago, became effective Feb. 1 when the combined operation took the name of Parkersburg-Aetna Corp. Operating as divisions, Parkersburg Rig & Reel manufactures equipment used in the production, processing and storage of petroleum products; Aetna makes ball and roller bearings and related products.

A. Sidney Knowles, formerly chairman and president of Parkersburg, is chairman of the merged corporation. William A. Wood, Aetna president and treasurer, now holds the same offices in the new organization. Additional officers include W. V. Rathbone, J. J. Rozner and A. G. Evans-Lombe, vice presidents; P. O. Summers, secretary; E. A. Johnson, assistant secretary and assistant treasurer; H. N. Wilson, assistant treasurer.

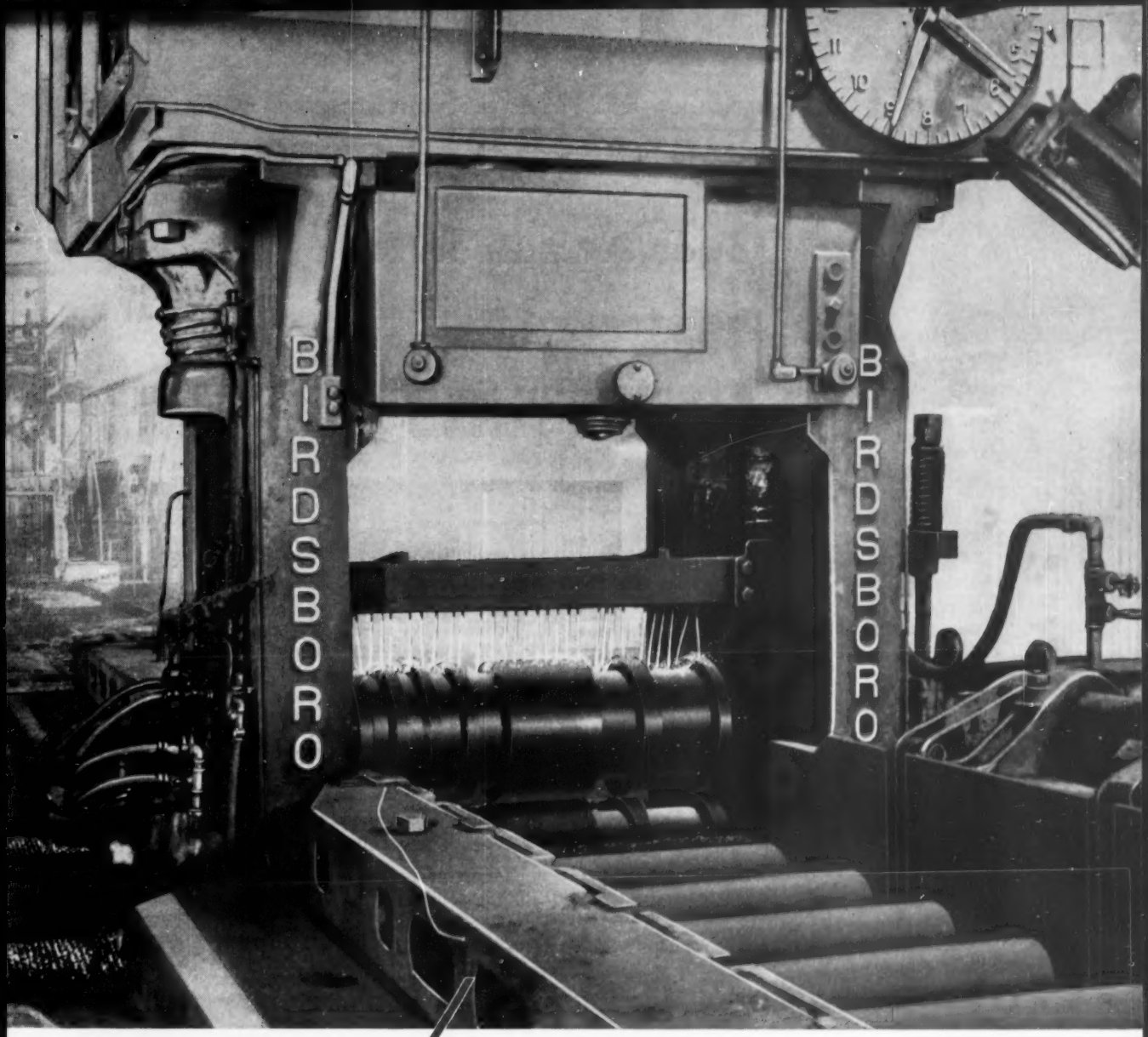


Illustration shows the 22" two-high Reversing Blooming Mill

SMALL, TWO-HIGH REVERSING MILLS

FOR THE ROLLING OF SEMI-FINISHED PRODUCTS

designed & built by

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA.

STEEL MILL MACHINERY

MM-27-53

Offices in Birdsboro, Pa. and Pittsburgh, Pa.

designers and builders of: Steel Mill Machinery • Crushing Machinery • Rolls • Hydraulic Presses • Special Machinery • Steel Castings

JONES & LAMSON REPORTS ITS RESEARCH ON COST-CUTTING IN THE INDUSTRY
metal turning

Jones & Lamson tells the story of its "Production Studies" Seminars

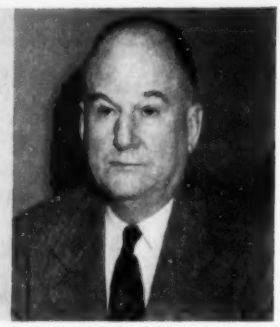
Since World War II, J&L has been intensively researching the hows, whys and wherefores of High Velocity Turning. In the course of making more than 12,000 advanced experiments in metal turning, we've learned a great deal. The importance of our findings demanded that they be shared with *all* of industry.

To do this effectively, J&L instituted a program of "Production Studies" Seminars. At these Seminars, held periodically in Springfield, Vt., J&L plays host to small groups of the nation's top production men. These visitors, in two days of chalk talks, movies and production-line demonstrations, get the facts on High Velocity Turning. Back at their own plants, this knowledge helps them to improve quality, boost production and cut costs.

At regular intervals in these pages, J&L will present specific case histories that show how J&L Research is paying off for industry.

"... actual production experience with our new High Velocity data, tools and techniques proves beyond a doubt that metal-cutting efficiency can be increased anywhere from 30% to 300%, often with existing machines."

JAMES C. HEBERT
General Sales Mgr.
Jones & Lamson Machine Co.



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STEEL

February 8, 1954

Technical Outlook

$2 MILLION A TON—Think cold rolled prices are high? How would you like to pay this much for a ton of steel? It's a nickel-steel containing 4 per cent moly and 79 per cent nickel. Real reason for its cost is its rolled thickness—sixteen sheets pressed together will approximate the thickness of a human hair. Armco is making it for the tiny memory cores so vital to electronic computers.

INSTANT-ACTING INHIBITOR—Probably the most serious remaining deterrent to further acceptance of the vapor rust inhibitors—lag time between packaging and vapor protection—is going by the boards. This period, from a few hours to two days before full rust control is realized, has been responsible for considerable research effort among all the inhibitor manufacturers. Now Nox-Rust Chemical Corp. will announce an instant-acting wrap that achieves control in seconds, available throughout its Vapor-Wrapper line.

ELECTRICAL SWITCH—Now in the engineering stage, automation systems will be put to work in the assembly of electric motors and appliance components. On the motor assembly line, the contemplated system will process one motor size for about a week. Then it'll be converted to handle another size. Result—automated versatility.

AUTOMATION FOR THE JOB SHOP—Not enough effort has been put into increasing productivity of job-shop operations which account for the greatest volume in metalworking, according to researchers in General Electric's Electronics Park laboratories. So they're at work devising a flexible, punch-card system that will enable swift changes in production from a given machine without retooling or operator training. New directions would be punched into the card and the machine's brain would perform the necessary changes. Don't rush to put your order in . . GE will be experimenting for another couple of years before they're ready to market the system.

TOUGHER GASKETS—Rubber that is said to have the best thermal properties of silicones but offers greater tear strength and oil resistance has been announced by General Electric. Expected to find use as a gasketing material in chemical processing equipment where high temperatures, pressure or vacuum exists, it has survived flight tests in jet engines and other aircraft equipment.

CHEAPER TITANIUM—An electrolytic extraction process for separating titanium from its ore has been developed by a Columbia University graduate student of engineering. If proved commercially feasible, process is expected to slash the present $6-12 per-pound price to something closer to a practical level. With quality steel selling at 60 cents per pound, however, the wonder metal has a long way to go before any but military users give it a second look.

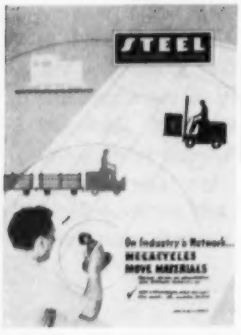
UP AND DOWN— An instrument that will prospect for oil and minerals or trace air current along future air routes 25 miles up has been developed by Byron Jackson Co., Los Angeles, and Vivian Associates, Palo Alto, Calif. Called a spinning proton, it involves nuclear induction and resonance.

HEARING AID—Pilot tests to determine the nature and extent of hearing loss among production workers in several Chicago area plants are being planned by Beltone Hearing Aid Co. One of the aims is to help management channel personnel to proper job assignments.

Metalworking Outlook—p. 59 *Market Outlook—p. 169*

General Electric

Dispatcher at Exide's Crescentville plant uses small magnetic blocks on a plant layout drawing to keep roving trucks spotted as he talks to drivers



ON INDUSTRY'S NETWORK . . .

Megacycles Move Materials

Radio, the unseen expediter, gives production management a voice in every handling operation. Manufacturers are profiting handsomely from its co-ordinating effect

By WILLIAM R. WOLFE
Assistant Editor

IN THE LATE 1920's, a few law enforcement agencies, frustrated by wiley bootleggers operating outside the Volstead Act, installed standard broadcast band radio receivers in patrol cars. For transmission, they arranged for their dispatchers to interrupt commercial programs over local stations.

The effect was so gratifying that many a defendant was heard to complain that his appearance before the bar had been achieved by something less than fair tactics. Technically, the result of this early success was a compulsion for improvement that produced frequency modulation systems—much more practical for mobile installation.

FM opened the circuit to mobile two-way communication markets. The taxi companies made the end of World War II their signal for mass adoption of radio. In 1946, Yellow Cab Co. agreed to a test installation in Cleveland, the first. Seven years later, there were about 3500 U. S. base or transmitter stations controlling 70,000 to 75,000 taxi units. The attraction, people in the business agree, was a strong customer sales appeal and more important, virtual elimination of no-payload cruising.

What's Industry's Stake? — Lessons learned in law enforcement and by common carriers have made transition of the technique to industry a natural. Other ways to co-ordinate handling have been notable for their shortcomings. Light flasher systems are expensive, must extend all over a plant and still drivers fail to see them. Loud-speakers and buzzers disturb everyone. So equipment stands idle or travels empty for long distances to get job assignments. In practice, supervisors finally send out search parties when emergency work arises.

Advantages of radio overcome these deficiencies. Plus values fall into three general categories: Less deadheading or waiting time; faster service; more work per handling unit.

Radio permits a system wherein all requests for handling are channeled through one dispatcher, who thus becomes a co-ordinator for

foremen and drivers in and out of the plant. It gives the dispatcher constant visualization of the location of handling equipment with respect to its relative need. In many cases, supervisors who spent their time tracking down equipment to assign work can be relocated in more productive pursuits. Emergency situations get emergency treatment and downtime on mobile equipment is no longer fatal to scheduling.

These advantages are reflected by industry's acceptance. The first intraplant transmitting license was granted in 1949. By November, 1953, a total of 127 U. S. producing, manufacturing and fabricating firms had adopted the system.

Where Does Radio Fit?—Generally, if you are operating handling equipment on nonrepetitive work through several departments or into outdoor areas without direct communication, you're losing money on the arrangement. The illustration advanced by R. H. Graves, U. S. Metals Refining Co., who says he would use radio if he had only one truck, could probably be defended if the handling job were free-running, or interdepartmental.

Radio won't work where management is unable or unwilling to agree on a single dispatching point for order assignment. In one foundry operation, the company installed 12 radio receivers, but insisted that control points in three separate areas have equal priority in assigning jobs. Result was confusion compounded until a single dispatcher took over. Today the company is using 28 mobile units and is licensed to use 55.

In Terms of Technique — Long hauls for handling equipment have been cited as the reason for almost every known production bottleneck. Radio points up the fact that poor communication, not distance, is more often the real stopper. One of the most effective installations is operated by Electric Storage Battery Co. at its Crescentville plant in Philadelphia. Although production areas cover 900,000 sq ft of floor space, all interdepartmental handling is done by lift truck.

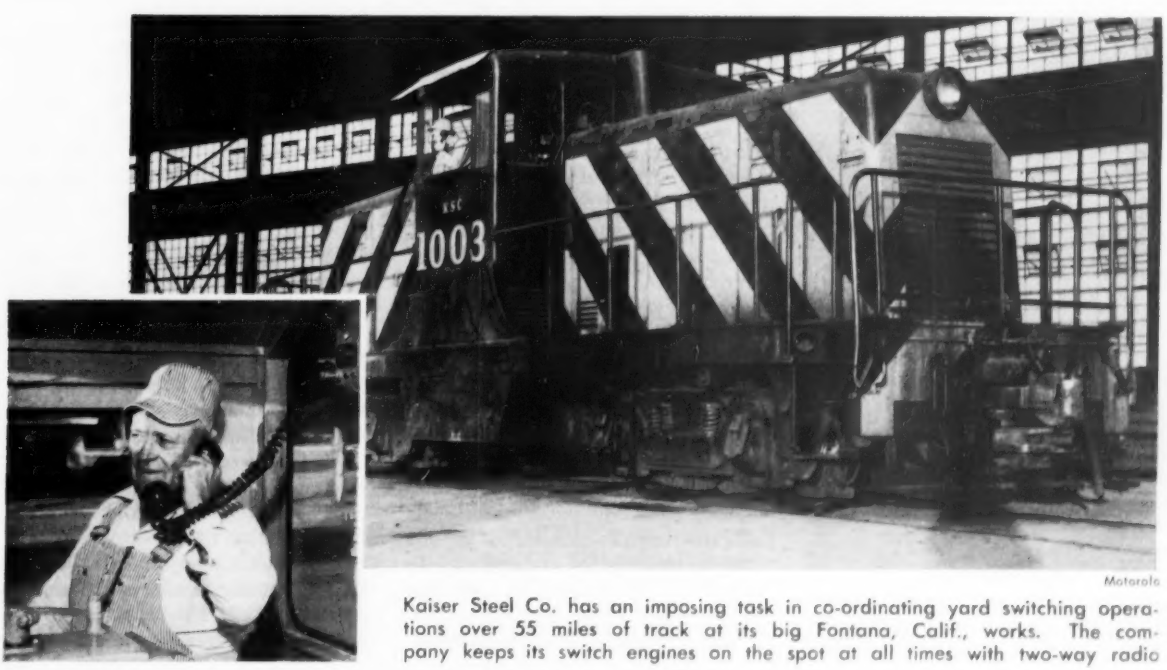
The company operates about 90 trucks, 10 of which are roving radio-equipped units assigned to work in geographical areas independent of functions in various departments. The roving trucks are called to handle only heavy jobs beyond the capacity of trucks doing repetitive work, or to progress material from one department to another up to about 1000 feet.

Although the Crescentville plant is a new one-story setup, in contrast to an old multi-story building, the company says it is still able to attribute 30 to 40 per cent more work per truck to radio. Today, 90 trucks do a job in 900,000 sq ft that required 160 trucks in the 350,000 sq ft multi-story plant.

Translated to Dollars —Central radio direction is not only a smoother job with fewer headaches; it can be translated immediately to dollars.

Thompson Products Co. operates 38 radio units—four in plant protection, 34 on personnel carriers, tractors and lift trucks—at its E. 222nd St. plant in Cleveland. Handling equipment is all metered, so an accurate gage of running time is always available. The picture presented by William V. H. Moore, Tapco's handling director, shows that equipment was moving 90 per cent of the time before installation of radio; this figure is now down to about 85 per cent. But, the trucks are loaded 90 per cent of the time they're on the move, whereas Tapco figured it was fortunate to hit 50 per cent before reliance on radio contact.

Upshot of refined communications, says Mr. Moore, was a sav-



Motorola

Kaiser Steel Co. has an imposing task in co-ordinating yard switching operations over 55 miles of track at its big Fontana, Calif., works. The company keeps its switch engines on the spot at all times with two-way radio

Radio in cabs of loading shovels, draglines means faster action on material orders, quick report of breakdowns

Carbon Limestone Co. co-ordinates its entire operation with a two-way radio network. The company reports its installation includes direct communication from headquarters to locomotives, shovels and extending to supervisory cars

ing of $230,000 in 1953—a figure based on the company's current production and number of radios.

Growing Audience — Naturally, radio's control extends beyond industrial trucks—and plant walls. This is particularly true at Kaiser Steel Co.'s Fontana works where operations must be integrated over 1600 acres. Kaiser has 55 miles of standard gage railroad track strung around the mill and through plant buildings, routing approximately 8000 cars per month. By the time it survives multiple weighing, routing, timing, etc., a car may move as many as 60 times before reaching its final destination.

The company uses radio on all 12 of its diesel locomotives operating in the plant area. Direct contact is maintained with the yardmaster's office, the ingot scales and open hearth pit office. Also equipped with radio are the yardmaster's pickup truck, general maintenance and track maintenance trucks.

Flexible Schedules — The yardmaster gets all requests for material shipment, outlines the job to an engineer in a switch engine. Time from request to action on the order is about 2 minutes. Before radio, the yardmaster had to get into his car or set out on foot in search of the engine—an inflexibility that was particularly disturbing when changes were necessary in previously-arranged schedules or someone needed a rush delivery.

As in every other handling function that takes on radio, one of the most profitable features is virtual elimination of deadhead travel and waiting time. The yardmaster picks off the engine closest to needed cars in making an assignment; he can direct the engineer to proceed immediately to a succeeding job.

Radio is also invaluable in maintenance. For example, derailments are common, particularly when locomotives pass over the slag dump. But out-of-service time practically disappears because the engineer can call in a track maintenance truck and have the engine back on the tracks in a matter of minutes.

Applications Unlimited — Once adopted, radio makes its own way. Bethlehem Steel Corp. experimented with its first unit a little more than three years ago. The number of complete separate systems since has grown through four steel plants and six shipyards, plus a number of field operations at temporary locations. Seven of the major installations were completed during the year ended Aug. 15, 1953.

Development of uses in an individual plant is illustrated by the case of the company's works at Bethlehem, Pa. In February, 1953, they installed mobile units on five yard trucks assigned to central transportation for general hauling service. This was so successful that additional vehicles were similarly equipped until the total reached 30. Effectiveness of radio on transport vehicles led to an investigation of additional areas of application. Initial result has been installation of 15 units used by maintenance crews working in in-

Two-way auto units, like this guard's equipment at Beech Aircraft Co., tie plant protection into central control

Stake trucks used for material movement within the plant area can be directed smoothly by radio. Assignment comes without deadheading or costly waiting time

Consolidated Vultee Aircraft Corp., Ft. Worth, Tex., estimates radios it installed on in-plant and yard-handling vehicles will mean an annual $30,000 saving

accessible areas — particularly on emergency repair work requiring co-ordinated action. Other applications are under study.

Licensing — The intricacies of processing a request for a license to use radio through the Federal Communication Commission need not disturb a potential user. As a practical matter radio manufacturers or their representatives will handle the details and full licensing is usually available in 60 days.

When FCC set up its licensing procedure for industrial radio in July, 1949, it outlined two different services: Low power and special industrial. The low-power service is available to any person or firm engaged in a commercial activity or industrial enterprise. Range within this category is approximately ½ to 1 mile with transmitting power held to a 3-w maximum. General Electric Co. conducted tests at Electronics Park and found low power at 3 w adequate to cover that 700,000 sq ft area.

If greater range is required, which it is in such extensive installations as the one at Kaiser Steel, special industrial service is necessary. To qualify, you must be engaged in a production, construction, fabrication or manufacturing activity that is in a sparsely settled region, of public character, and is to be used in a yard area where low-power service will not meet requirements. In special service, you can up your range 10 to 50 miles.

Setup, Maintenance—The same manufacturers' assistance is also available for determining necessary power output, height of antenna and number of mobile units necessary for desired coverage.

Most users keep radio sets in operating condition the same way TV sets are maintained. Majority of systems do not justify a full-time technician, but are kept in shape on a contract basis with a local repair firm. Some sort of special arrangement is necessary, because the FCC requires a licensed repair man to check and adjust each set every three months.

Another maintenance consideration involves a minor adjustment that must be made on vehicles equipped with radio. Because the radio operates off the vehicle's storage battery, most generators must be boosted to compensate for the added load. The alternative is too-frequent battery recharging.

Restrictions—The FCC keeps a tight rein on this communication medium. Many users feel it's too tight, arguing that present ground-rules are restrictive. One of the most onerous confines message interchange within the plant grounds of each licensee.

For instance, a jet engine component manufacturer maintains production and storage facilities in several buildings within a single city. The supplementary buildings are functionally related, physically separated from the main plant area. Under the present rule, the company can control material flow only within the confines of one building and yard area. They estimate ability to co-ordinate movement between main plant and separate buildings would increase productivity of personnel and equipment as much as 50 per cent.

A variation of the proplem occurs where vehicles must travel down a public highway to reach a storage area. Communications are cut off after equipment leaves the main plant grounds.

Room to Grow — A committee comprised of 56 industrial radio users and manufacturers is petitioning FCC for rules changes that would alleviate these situations. Their action is also an indication of industry's reception to radio: Five low-power frequencies are now available on a shared basis with four other commercial classes. The committee says it needs 40 more on an exclusive basis.

11:30 p.m., sprinklers on duty

11:35 p.m., fire breaks out

11:37 p.m., water checks fire

11:42 p.m., fire out, water off

11:52 p.m., sprinklers replaced

Grinnell Co.

8:00 a.m., business as usual

The First 2 Minutes COUNT THE MOST

Within this critical period of time a small industrial fire (the way most of them start) can be prevented from growing into a big one, if it is properly attacked

By HARRY CHANDLER
Associate Editor

THE BOYS at the small metalworking plant were brewing their morning coffee on a hotplate in a catch-all room just off the line. Miscellaneous buckets of paint, lacquer and oil were stored on a shelf above the hotplate, but no one ever thought of fire. The hotplate didn't give off an open flame; and, besides, there were a couple of automatic sprinklers overhead.

Looking back at it now, one of the sweepers had put a pail of paint on the shelf shortly after starting time. Its lid was loose; and since the old sweeper wasn't tall enough to reach up there on tiptoe, he sort of tossed the can. Of course, the contents sloshed a little, and when Ed, the man who made the coffee, went into the room around 7:10, he smelled paint but thought nothing of it. It always smelled like paint in there.

While Ed was back on the line (waiting for the coffee to perk), the spilled paint streamed down the wooden wall behind the shelf and dripped off the front of it, the latter splashing on the hotplate's cherry red burner. The first jagged tongues of flame had just jumped from the hotplate to the paint on the wall when Ed went in to see how the coffee was doing.

Fire!—Most fires start small. Except for explosions, even fires in extra hazardous spots usually can be brought under control if they are attacked with proper extinguishers within the first two minutes—fire (involving an ordinary combustible) can multiply itself 50 times in 8 minutes.

In many instances, retreat is the first impulse. Recently, a night watchman in a large plant discovered a small fire in a storeroom and ran 200 yards to an office to give the alarm. On the way, he passed 17 first aid extinguishers —any one of which was big enough to put out the blaze while it was small. By the time the local fire department arrived (in minutes) the fire was out of hand. End damage was in the million-dollar bracket.

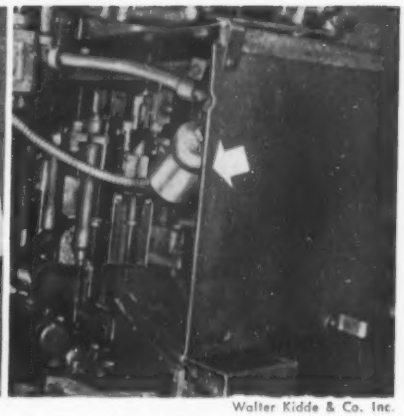
It's Time to Re-evaluate . .

Fire Protection Expert Says

Prof. John Ahern, director of fire protection and safety engineering at Illinois Institute of Technology, Chicago, and consultant to General Motors, recently told STEEL:

"It's time to look at how we have been doing things with an eye to taking advantage of advanced technology wherever we can. In the use of flammable liquids, for example, we should substitute noninflammables where we can. A hydraulic line under 2000 or 3000 psi can be a dangerous flame thrower if it breaks and the oil catches fire."

This is how Eaton Mfg. Co., Cleveland, packages its first aid fire equipment throughout its large plant



Walter Kidde & Co. Inc.

Oil caught fire two or three times a week in this machining operation. CO_2 system (arrow) was put in

Common Extinguishing Agents and How They Work . . .

Fire has three parts: Fuel, oxygen (or other oxidizing agent) and enough heat for combustion. Fires are put out by removing any of the three elements.

Water
In general, burning material is cooled below its ignition temperature. Water applied at 60°F that runs off after being heated to 80°F has a cooling effect of 20 Btu. Spray is highly efficient because it is largely evaporated into steam.

Carbon Dioxide
It reduces oxygen content of air to point where it will not support combustion—also may have a cooling effect. Reduction of oxygen from normal 21 to 15 per cent will extinguish most fires.

Foam
Protection is smothering coating and some cooling effect. Chemical foam is a mass of tiny, long-lasting bubbles of CO_2 gas that are not easily broken down by agitation or heat. Mechanical action—air is mixed in a solution of water and foam liquid to form a continuous mass of bubbles that look like whipped cream.

Dry Chemicals
Chiefly sodium bicarbonate with materials added to produce water repellency and free flowing characteristics. Breakdown of chemical in flame area produces CO_2 and water vapor.

But Ed didn't panic. He closed the door to the catchall (so it acted as a firedoor, shutting off drafts and confining the blaze) and yelled to a nearby workman. "Call plant protection; we've got a paint fire in here." Then he grabbed the second extinguisher he found, re-entered the smoke-filled room and played CO_2 gas on the wall-climbing flames. He didn't take the first extinguisher because it had water in it.

Three Kinds — Meanwhile, the plant fire chief called the municipal fire department and sounded the plant alarm. Because it was a fairly small plant, all power, gas and machines were shut off—in larger plants, the practice is to do this only in the fire area. Since a class B fire was involved (burning liquids, such as gasoline, oils and paints), the plant fire brigade went to the scene with an assortment of suitable extinguishers—dry chemical, foam, CO_2 and vaporizing liquid.

But the fire was out.

"You did the right thing," the chief commended Ed. "Only a deluge or fine spray of water properly applied are safe on a class B fire. Something that robs the air of oxygen and smothers the flame, like the CO_2 gas you used, is a good choice.

"Water is O.K. for class A fires—wood, paper, cloth, excelsior, rubbish and so on; but here you had another angle—the electric hotplate. Say fire burned off insulation on the cord. Water conducts electricity, you know; and you'd stand a chance of getting electrocuted. CO_2 will handle small surface fires of the class A type, and it is excellent for electrical fires—it is a nonconductor."

Backstopping — The minor fire incident at the metalworking plant (and others like it) is reenacted (on a smaller or larger scale) 340 times during an average day in U. S. industry. First aid fire equipment is the first line of defense. Adequately protected plants have a second ace in the hole to supplement the work of the Eds, the plant fire brigades and local fire departments.

The catch-all room had automatic sprinklers, called "by far the most important of all fire protection devices" by the National Fire Protection Association. They either put out a fire or hold it in check if the spray does not reach it. On most systems, actuation by heat is in a fixed temperature range. For example, fusible solder types in the low temperature bracket go off around 160°F; low test bulb and chemical types at 135°F.

Amount of water discharged by sprinklers depends upon water pressure—size of opening in all sprinklers is about the same. Seven to eight pounds of working pressure is generally considered a minimum for proper action. At this pressure, the sprinkler will discharge about 15 gpm over a floor area of more than 100 feet. To stay on the safe side, the average building has one sprinkler covering about 80 sq ft. In oc-

Causes of Fire . . . In Metalworking Industry

Special Hazards:

Hot work (welding, cutting, soldering)	11.5%
Ovens and dryers	11.0
Defective electrical equipment on processing units	10.5
Blowers, exhausts, ducts and fans	8.0
Sparks from stacks, flues, cupola chimneys	7.5
Improper or careless use of flammable liquids	6.5
Defective coke or coal burning furnaces	6.0
Quenching, hardening, annealing, tempering, soaking and salt bath tanks	6.0
Spray booths, rooms and operations	4.5
Sparks from machine tools, grinding, buffing, sanding, cutting, sawing, polishing	4.0
Spillage, leaking or sparks from molten metal during handling	2.5
Pitch, tar, grease, tallow, wax and glue	2.0
Gas furnaces	2.0
Dip tanks	2.0
Lab experiments	1.5
Sparks from furnace doors and traps igniting combustible roofing, etc.	1.2
Static sparks igniting flammable vapors during pouring, coating or spreading of flammable liquids	1.1
Sparks from forges	1.1
Hot castings stored near combustible materials	1.0
Japan dryer explosion	0.9
Sparks igniting textile materials at pickers, braiding machines, etc.	0.9
Friction spark at belting or chains	0.7
Special hazard dust, fines or gas explosions	0.6
Engine test block fires during tests	0.6
Magnesium chips ignited by sparks during tooling	0.5
Steel wool ignited by sparks at cutters	0.5
Defective air compressor equipment	0.5
Overheating of tinning tank	0.4
Gas or electric plates overheating	0.3
Crane or conveyor (improper operation or mechanical failure)	0.3
Overflow oil ignited in furnace pits	0.3
Overflow or spillage of fuel from tanks	0.2
Degreasing tanks	0.2
Hydraulic oils	0.1
Compressed gases (other than those used with oxy-acetylene equipment)	0.1
Miscellaneous	3.0

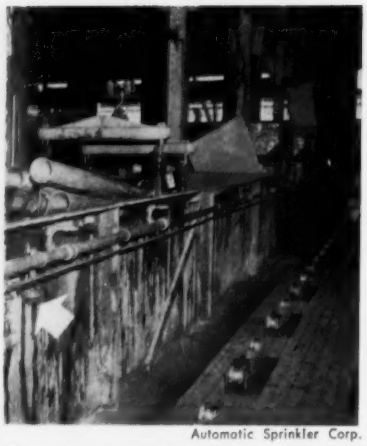
Common Hazards:

Spontaneous ignition	26%
Smoking and matches	21
Misuse of electricity	14
Heating defects	12
Exposure	9
Explosion (heat and power sources)	5
Lightning	2
Incendiary	2
Miscellaneous	9

Note:

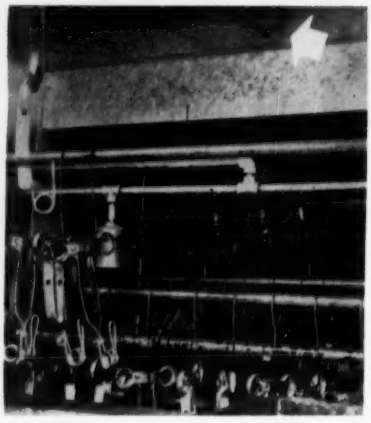
Period covered is 1930 to 1946.

Table was compiled by NFPA.



Automatic Sprinkler Corp.

Cleaning operation uses neutral spirits. Foam protects dipping tanks; spray nozzles protect the drain area



Abnormal rate of rise in temperature will be picked up by the detector (arrow) and touch off the fire system

cupancies where pipes can freeze, dry pipe or anti-freeze types are available. With the former, pipes normally contain air under pressure instead of water. When a sprinkler opens, air escapes and water is admitted automatically by a dry pipe valve.

Silent Watchmen—Of course, automatic sprinklers of the fixed temperature type give around-the-clock protection, but they are far from the latest word in scientific fire protection. You can get systems that go into action when they detect a rapid rate of rise in temperature, a puff of smoke, a finger of flame or even a dangerous concentration of combustible gases. They're linked to conventional systems that use the two basic agents of fire extinguishment: Water or spray that cools burning material below its ignition temperature and vehicles that smother a fire by cutting off oxygen in the air supply.

Gadgeteering possibilities challenge the imagination. With a rate-of-rise system, for example, the detecting device can sound an alarm, close fire doors, shut off power and dump containers of flammable liquids before sprinklers go into action. Beauty of this is that if someone is around to put the fire out by hand, the sprinkler or other system will not be actuated.

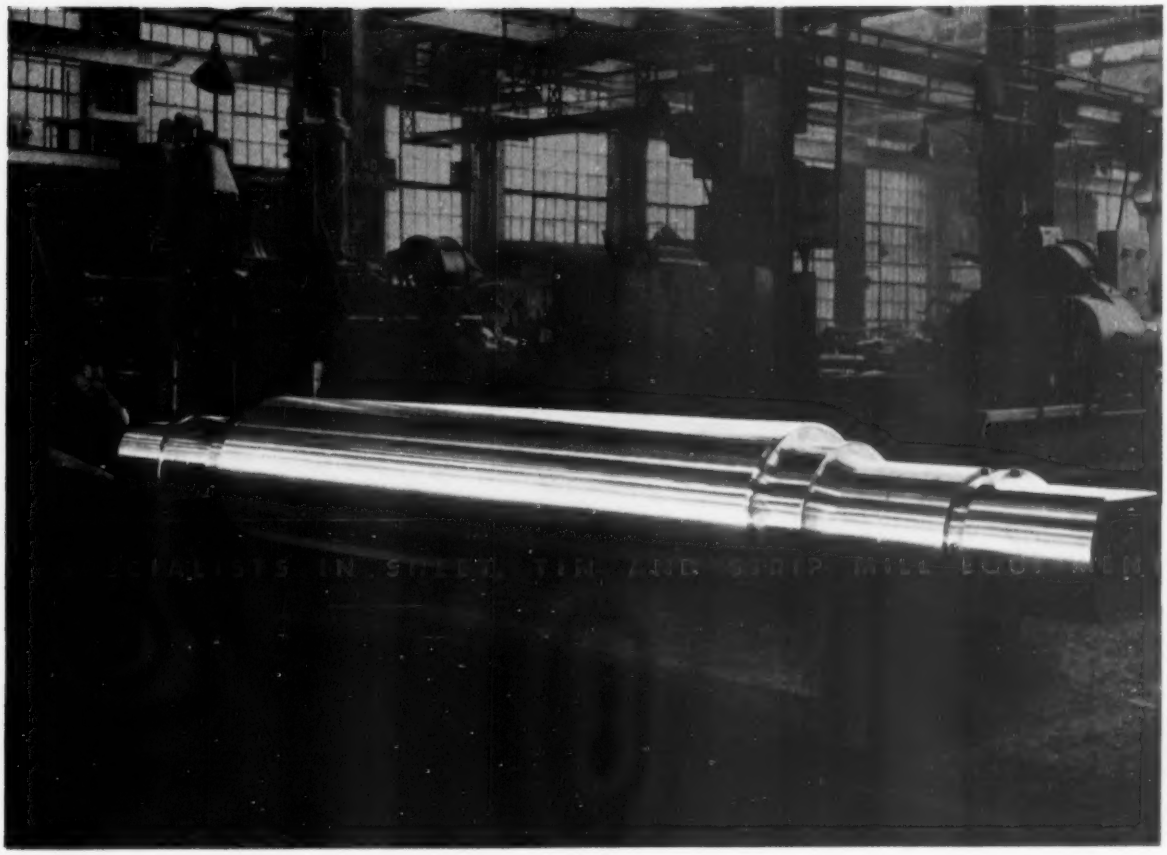
All-around Protection — Putting this wealth of equipment to work is a matter for fire protection engineers. There are many angles to consider. Looking at the big picture—the entire plant—W. K. Ousley, vice president, Boston Manufacturers Mutual Fire Insurance Co., recently told the SAE in Detroit:

"A study of all major fires in industrial history will show that every single one could have been avoided if five simple, fundamental rules had been followed. . . . use safe construction, install sprinklers for all combustibles, provide enough water, train your people in fire safety and provide wholehearted support by top management."

On construction he says: "From a fire standpoint, it doesn't make too much difference whether you construct your buildings of brick, steel, concrete or wood—as long as you avoid wooden walls and quick-burning boards on joists, roofs and floors . . . a basic question you must ask yourself is: 'How much of the plant can I afford to lose?' " (Cheaper insurance rates are important, of course; but interruption of business is one of the prime considerations these days.)

Mr. Ousley advises: When contents in a combustible or noncombustible building are generally combustible, (under best conditions) a single fire area should not exceed 100,000 sq ft. Valuable concentrations of combustibles or hazardous operations will greatly reduce the permissible area. If contents in noncombustible buildings are generally noncombustible, areas may be as large as desired

(Continued on p. 122)



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What are your large or small roll problems? Let Midvale help you. Our 80 years of experience, highly skilled craftsmen, plus complete facilities for producing and shaping our steel are at your service. Our recommendations about material, hardness and design are yours to help increase your tonnage rolled of steel, aluminum, copper and other metals. Why not consult us about your roll problems?

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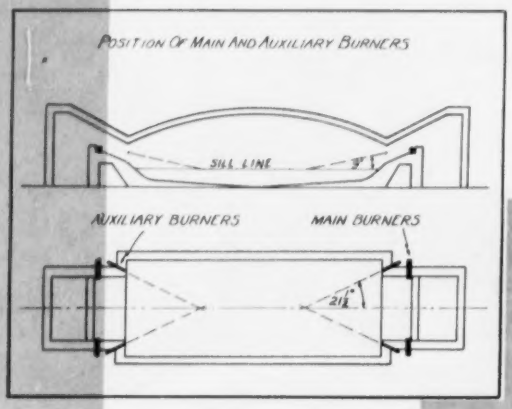
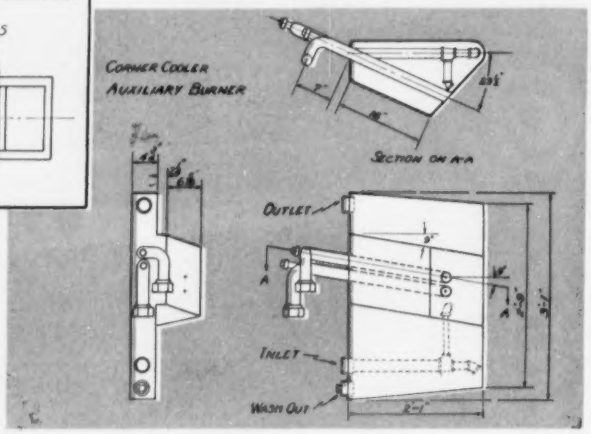


Plan and section views of furnace show location of main and auxiliary burners. Latter are pitched 9 degrees, and 12-foot flames converge at the sill line

The corner coolers had to be redesigned to make burner pipes an integral part of the cooler. Burner pipes in the original design got too hot and actually burned away



Oxygen Shortens Open Hearth Meltdowns

Work with auxiliary corner burners is paying off at Armco's Ashland works. Tap-to-tap time and tonnage are better and Btu economy makes it profitable

By O. D. EYRE
Sr. Fuel Study Man
Armco Steel Corp.
Ashland, Ky.

EARLY in 1953, with Ashland's new hot strip mill nearing completion, it was recognized that much greater ingot tonnage was needed from the open hearth shop in an effort to bridge the gap between mill capacity and available tonnage. Possibility of using auxiliary oxygen and coke oven gas burners looked like a good avenue to study in the search for more output.

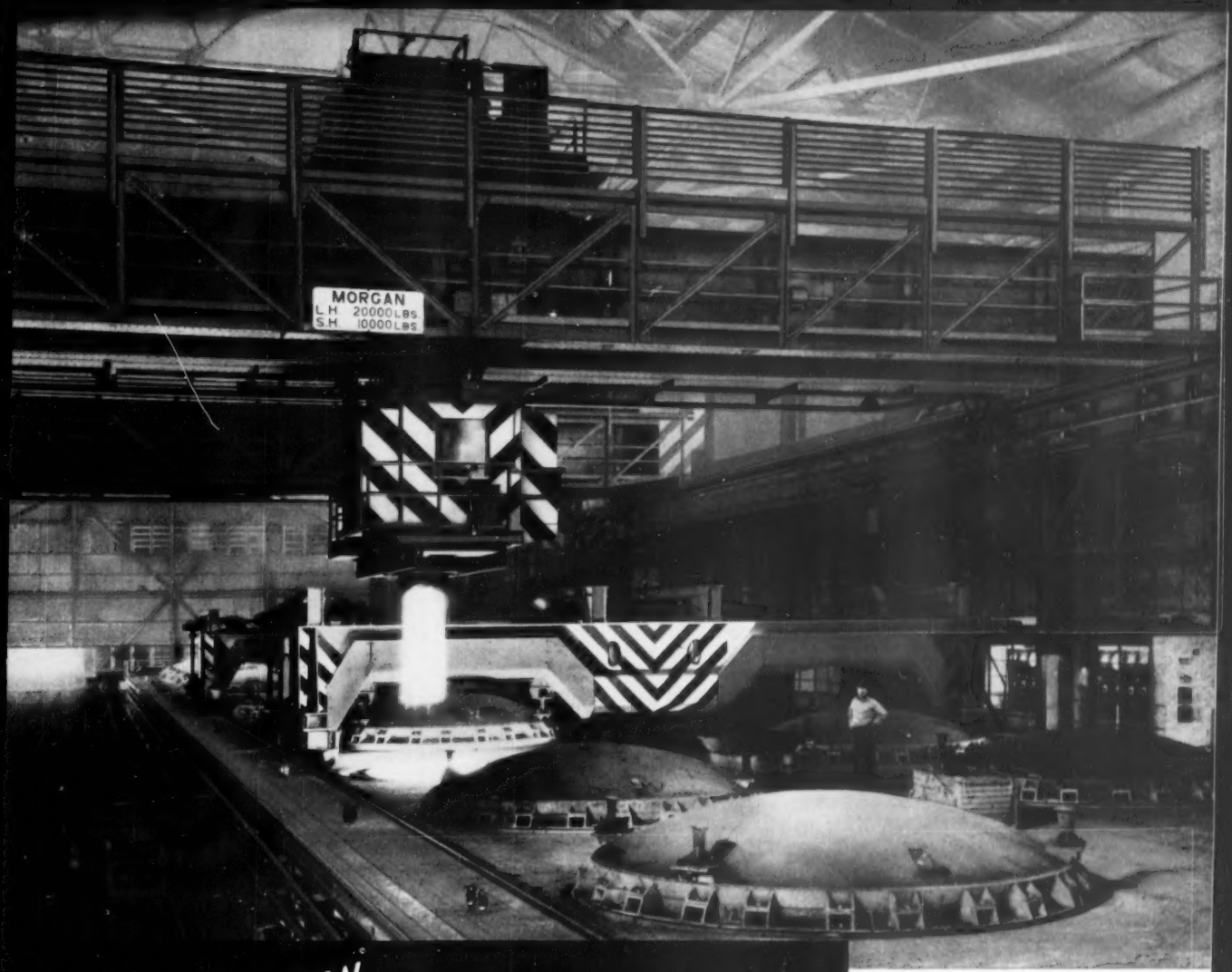
The eight open hearths at Ashland, to begin with, were originally designed for smaller heats, but by lengthening and deepening the hearths capacity was raised to 170 tons. Checker volume during these changes remained essentially the same.

Low Pressure Gas—Shop differs from most others in that all furnaces are designed to burn low pressure gas with only ½ psi pressure at the burner. Coke oven or natural gas is used as fuel; 123,000 cfh coke oven gas being used during melt-down when available, and 40,000 cfh natural gas during working period of the heat.

Side burners are used in place of end burners commonly used on liquid or combination liquid and gas fired furnaces. Burners at each end of the furnace consist of two 4-inch pipes opposite one another which feed gas in behind the bridgewall. To enable flame direction to be controlled the port floor is sloped approximately 2½ inches per foot from the base of the bridgewall toward the sill line of the furnace. (see Fig. 1)

Burner Design—Although it was desired to increase production from this type of furnace by the use of auxiliary oxygen and coke oven gas during melt-down period, application through the main burners was not feasible since they are located on the sides of the ports. By redesigning the port corner coolers, however, rebuilding them with a box arrangement on the side, the 1¼-inch pipe for oxygen and the 1-inch pipe for coke oven gas could be arranged one over the other.

The opening through the cooler was designed so that flame from the burners would tend to converge at the sill line in the middle of the hearth between the second and third door. Standard four-inch lines for coke oven gas and oxygen were installed from existing



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MORGAN CRANES AT PUEBLO

Illustrated is one of two Morgan 10-ton, 7-motor, 94′5″ span Soaking Pit Cranes at The Colorado Fuel & Iron Corporation's Pueblo Works. These cranes have a tongs range of 15″-30″. All motions on trolley are through worm reduction units. The trolley frame, bridge trucks and ram are fabricated and welded into one-piece units.

Morgan has followed very closely the development of soaking pit cranes from the first tower and rack type to the present modern low stiff leg type built with or without counter-weights. Send for Bulletin 32-A.

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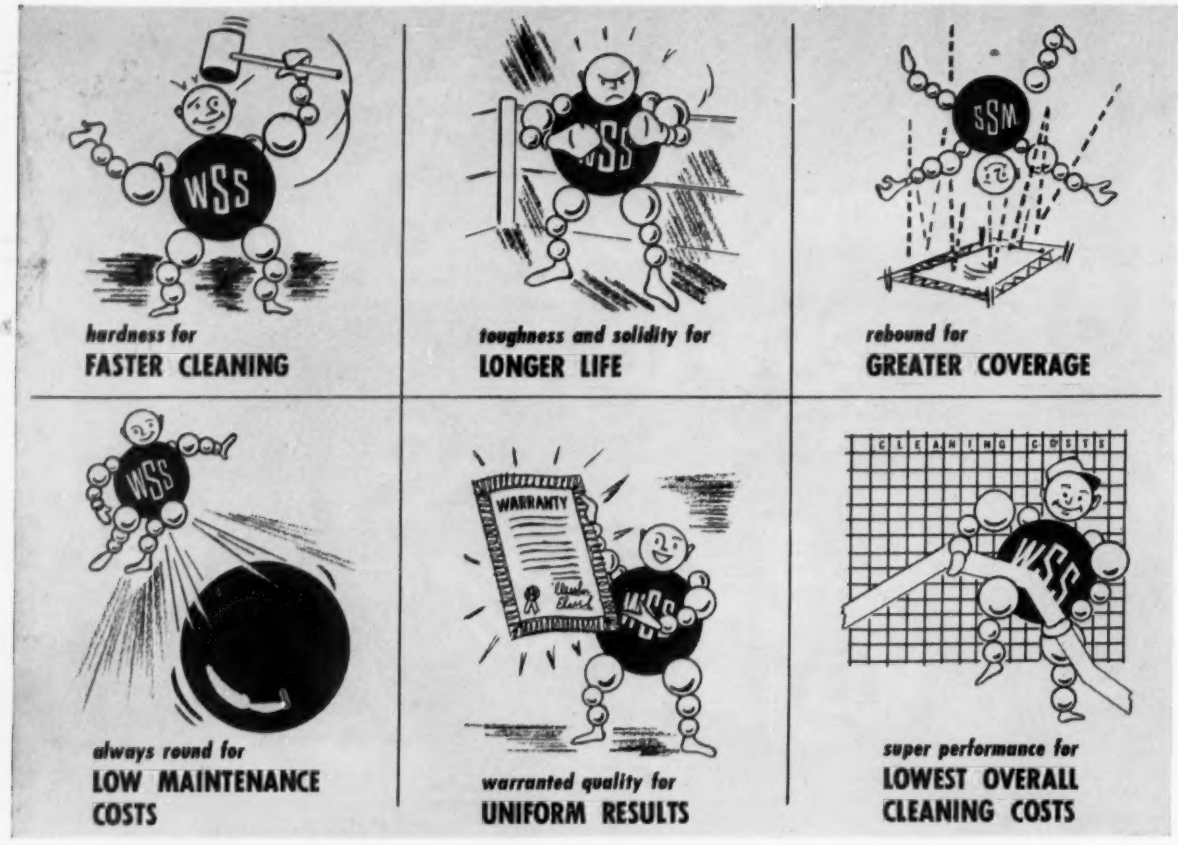

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control panel to the furnace. Two solenoid valves were located at each of the four auxiliary burners, one for gas, the other for oxygen. They were electrically connected by relays through the automatic furnace reversal panel so as to function with the main burners.

Early Setbacks — Preliminary tests indicated that the burners were of insufficient capacity to allow the desired flow rate of auxiliary oxygen and coke oven gas input to the furnace. Flame was terrifically hot, colorless and about 12 feet in length as planned; direction was also good. But after 30 minutes test one of the corner coolers had burned out and water was streaming into the bath.

Evidently the burner pipes sticking through the corner cooler had become too hot when on the outgoing end, so the minute the oxygen was turned on it burned off.

Quick Redesign—It was calculated that burner pipes, if they were to deliver gas at the required 10-psi pressure, both had to be 1½ inches in diameter. At the same time, it was determined that corner coolers would need to be redesigned (Fig. 2) to make the burner pipes an integral part of the cooler.

By adjusting the oxygen pressure at the panel to 25 psi and using the 10-psi coke oven gas pressure (maximum available) it was felt that proper oxygen and coke oven gas flows, together with flame direction, could be maintained without difficulty. Production tests were now ready.

First Roof — What with the necessary redesign of the burner and corner cooler, actual use didn't begin until the 62nd heat of the first roof. Both oxygen and coke oven gas flows were actually maintained at 53,000 cfh, and at the same time 123,000 cfh coke oven gas plus the normal amount of combustion air was used on the main burners. Table I shows the results.

By close observation of the roof, it was established that auxiliary burners could be left on for a period of two hours on low carbon heats and one hour and 40 minutes on high carbon heats. Difference in firing time is due mainly to the amount of cold scrap being charged. After some trial, procedure was to turn on the auxiliary burners just as soon as one end had been partially charged with starter. This was done to give starter a better chance to become heated before covering it with finished scrap.

Patching of the roof became necessary after the 105th heat, so it was decided to resume operations with a reduced auxiliary input of 35,000 cfh gas and oxygen. Results are shown in Table II, and it is easily seen why we went back to 50,000 cfh operation in the second and succeeding roofs.

Campaign Results — To summarize the test results attained during the complete combustion-oxygen campaign, the heats on which the 50,000 cfh auxiliary fuel input was used compared to the three other campaign totals as follows:

1. T-T time reduced 1.90 hours, or 13.99 per cent
2. M Btu/Heat reduced 49.6 M Btu, or 8.46 per cent
3. T-T TPH increased 2.11 TPH, or 16.67 per cent
4. M Btu/Ton reduced 0.299 M Btu/Ton, or 8.77 per cent

Total oxygen consumption during the campaign was as follows:
Oxygen per heat ..... 91.8 MCF
Oxygen per ton ..... 532.1 CF

Operating Effects—Combustion test conducted on the 319th heat of the campaign indicated below normal stoppage in the checkers. There was no visible slag buildup in the slag packets, and about normal buildup in the fantail areas. Checkers appeared to be burned no more than usual. Observation inside the furnace at conclusion of the campaign showed normal conditions to exist in the auxiliary system.

Observations of the test heats during first and second roofs of the campaign indicated that there are a great number of different kinds of delays which make the furnace show up poorly. Though some are necessarily unavoidable, a large portion of the total could be reduced to a minimum by the installation of better scrap preparation facilities, charging floor and pit facilities. Such improvements are being made, and then only the furnace itself will be the bottleneck. Under these conditions it will be possible to obtain the full benefit from the oxygen and coke oven gas burners.

COMBUSTION OXYGEN HEATS COMPARED TO THREE PREVIOUS CAMPAIGNS WITHOUT OXYGEN

TABLE I — 1ST ROOF
HEAT NOS. 62-105 INC. — 50,000 CFH OXYGEN

ITEMS	PREVIOUS CAMPAIGNS	OXYGEN HEATS	UNIT DIFFERENCE	% UNIT DIFFERENCE
CHG-T HRS./HT	11.94	9.97	−1.97	−16.50
T-T HRS./HT	12.77	11.04	−1.73	−13.55
TONS/HEAT	171.5	168.6		
M BTU/HEAT	573	537	−36	−6.28
CHG-T TPH	14.36	16.92	+2.56	+17.92
T-T TPH	13.43	15.27	+1.84	+13.70
M BTU/TON	3.340	3.187	−0.153	−4.58

TABLE II — 1ST ROOF
HEAT NOS. 106-127 INC. — 35,000 CFH OXYGEN

ITEMS	PREVIOUS CAMPAIGNS	OXYGEN HEATS	UNIT DIFFERENCE	% UNIT DIFFERENCE
CHG-T HRS./HT	12.18	10.70	−1.48	−12.15
T-T HRS./HT	13.00	11.86	−1.14	−8.72
TONS/HEAT	170.5	172.1		
M BTU/HEAT	598	554	−44	−7.36
CHG-T TPH	13.99	16.08	+2.09	+14.93
T-T TPH	13.03	14.42	+1.39	+10.67
M BTU/TON	3.510	3.221	−0.289	−8.23

TABLE III — 2ND ROOF
HEAT NOS. 0-107 INC. — 50,000 CFH OXYGEN

ITEMS	PREVIOUS CAMPAIGNS	OXYGEN HEATS	UNIT DIFFERENCE	% UNIT DIFFERENCE
CHG-T HRS./HT	12.72	11.02	−1.70	−13.36
T-T HRS./HT	13.60	11.97	−1.63	−11.99
TONS/HEAT	171.9	172.0		
M BTU/HEAT	566	544	−42	−7.25
CHG-T TPH	13.51	15.61	+2.10	+15.54
T-T TPH	12.63	14.37	+1.74	+13.78
M BTU/TON	3.411	3.162	−0.249	−7.30

Test figures for first two roofs of campaign illustrate gains made with auxiliary burners. Production is expected to be even better after improvements are made in scrap preparation and in charging pit facilities

From a paper presented at the Fall Meeting, Southern Ohio Section, National Open Hearth Committee, AIME.

CUT ANY METAL to close

Stroboscopic photo "stops" wheel for 1/10,000 of a second. (Guards removed to show detail.)

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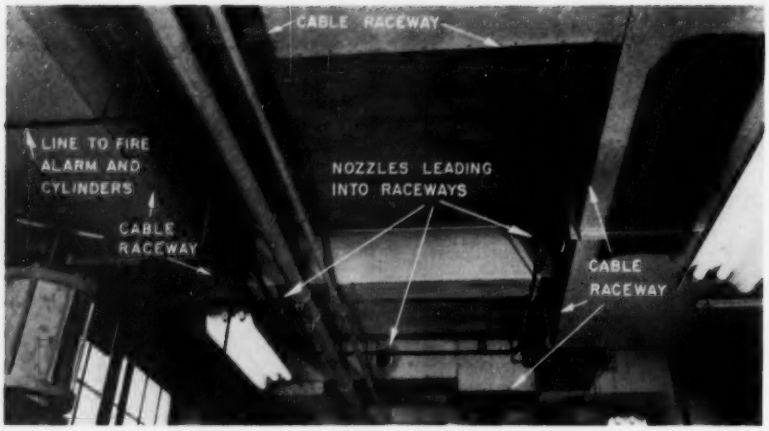

This enclosed protection was devised for cable raceways at an automobile plant. Enclosures, such as air conditioners, ventilators, can spread fire

(Continued from p. 114)

if concentrations of combustibles are segregated within fire-resistive walls. In multistory buildings, stairs, elevators and other floor openings should be enclosed with materials at least as fire resistive as the floors.

Enough Water—Average water demand for sprinklers over moderate combustibles is about ¼ gpm per square foot of floor area, according to Ousley.

"Therefore," he says, "if sprinklers are called upon over 8000 sq ft of floor area, the water demand will be 2000 gpm, which only the strongest water systems can supply. Highly combustible materials need even more water. For example, rubber tires piled to 12 feet require about ½ gpm per square foot of floor space.

"An adequate water source will supply all sprinklers (likely to operate for the probable duration of the fire) and simultaneously supply water for hose streams—about 250 gpm or more per hose." Thus supplementary elevated gravity or pump tanks may be needed.

Pinpointing — No building is more fireproof than the work carried on inside it. From 1930 to 1946, the metalworking industry had 6817 reported fires, according to the National Fire Protection Association. Breakdown (see table) shows that 63 per cent were caused by special hazards, 28 per cent by common hazards and 9 per cent by unknown causes.

Hot work (welding, cutting, soldering) accounted for 11.5 per cent of the special hazard fires to top the list. Ovens and dryers were in second place at 11 per cent. Under common hazards, spontaneous ignition (26 per cent) and smoking and matches (21 per cent) came in first and second.

Following are some case histories of fire hazards in the metalworking industry and how they are protected.

Polishing—Oil baths to overcome extreme heat generated by high speed metal polishing posed a severe fire problem in a large Ohio plant. A spark in the vicinity of oil vapors in the machine often set off flash fires that could spread to an adjacent oil trench and pit.

Fire protection engineers installed rate-of-rise heat detectors in the polisher, trench and pit. High pressure CO_2 is the extinguishing agent. Supplemental safeguards include two CO_2 first aid extinguishers.

Painting—In a California auto assembly plant, all small parts and sheet metal sections (such as hoods and fenders) move on an overhead conveyor and converge on a huge machine where recirculating paint pours over them. The enamel is flammable and vapors produced are highly volatile.

Explosion-proof lights, motors and switches are in the area; no more than 150 gallons of paint are at the machine at any one time; nonsparking tools are used in the painting area; smoking is a dismissal violation; machine is grounded and has static accumulators; volatile vapors are drawn off by powerful ventilators and passed through a cleansing wash; areas around the machine are water sprinklered; and the entire machine assembly is meticulously cleaned every night.

In spite of these precautions, management was still afraid of fire. A CO_2 system (using rate-of-rise detectors) was installed in the machine and drip tunnel—remote control boxes also allow manual operation. When the system goes off, pressure-operated switches cause all electrical circuits in the area to be secured, ventilation is turned off, the conveyor is halted, paint spraying is stopped and 150 gallons of paint is dumped into underground tanks.

Fume Control—Ventilating systems themselves can spread a fire. In an eastern plant, pipe was coated and wrapped. Several serious fires had occurred in the fume ventilating ductwork that carries off fumes from tar dip kettles.

Normal way to handle this would be to provide protection within the system; but operators did not like the idea of using water in the ductwork, because of the possibility of overflow into hot tar in the kettles. Fire protection engineers devised a system that applies a fine spray of water on the outside of the ductwork. Theory is that water applied to the outside would cool the metal and prevent damage, should a fire occur within the ducts. Dampers also were installed inside the ductwork.

Others—A steel manufacturer in the Pittsburgh area used low-pressure, CO_2 systems (with rate-of-rise equipment) to protect oil cellars, mill motor and mill generator sets.

Another Pennsylvania manufacturer (household appliances and auto parts) considers a 750-ton press as a vital cog in the plant. Oil and grease around the base of the press were a fire hazard. Company installed a special water spray system.

A Canadian firm with paint dip tanks and ovens chooses a dry chemical system as being best adapted for its risk.

This article is based in part on material supplied by the following companies: Automatic Sprinkler Corp. of America, Walter Kidde & Co. Inc., Cardox Corp., Grinnell Co. Inc., Pyrene Mfg. Co. and C-O-Two Fire Equipment Co.

It's outstanding!

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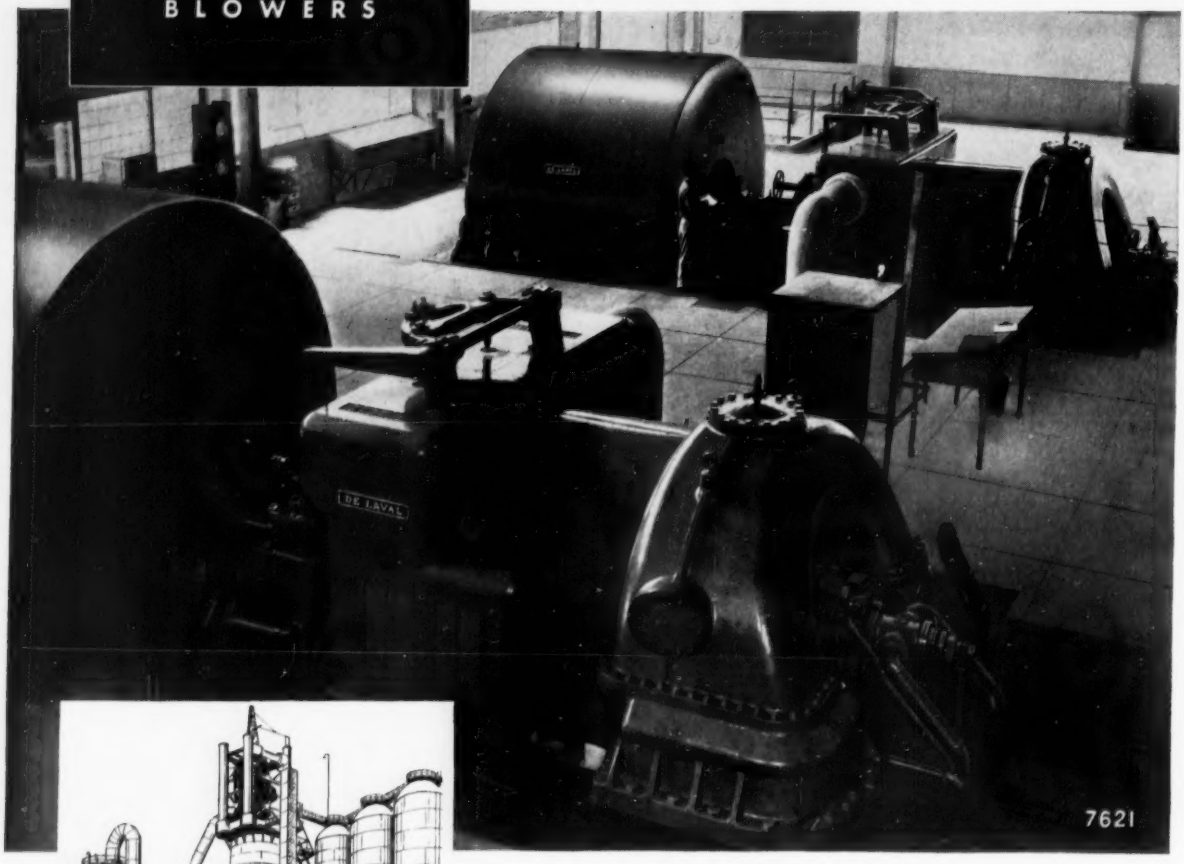
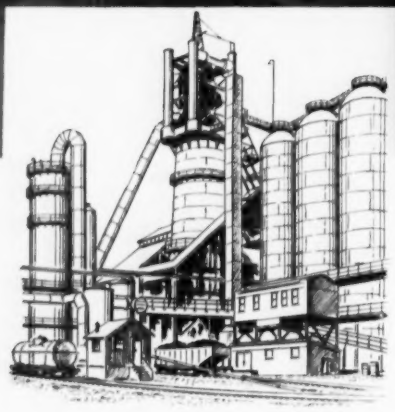
DE LAVAL
STEEL MILL BLOWERS

designed for giant furnaces





These twin De Laval blowers, on the job in a leading mid-western steel mill, are among the largest ever built. Each is a five-stage unit with a rated capacity to deliver 121,000 cfm of air at 35 psig discharge pressure. Each is driven by a 15,220 hp, 2,500 rpm De Laval 16-stage steam turbine operating under steam conditions of 400 psig, 750 F with 28 in. vac.

The total weight of each De Laval turbine and blower is over 167 tons; the blower alone is over 212,000 lbs. Shafts of the turbine and blower were made large and heavy to meet the wide range of varying speed conditions required in blast furnace service. Outside diameter of the blower casing is 12 ft. and it is divided horizontally in the plane of the shaft. This permits raising the upper half of the casing for easy access to all interior parts. • For a quarter of a century, De Laval has pioneered in advanced blower engineering designs and practices. De Laval builds single and multi-stage centrifugal blowers and compressors for service in steel, gas and coke plants. Discuss your specific applications with a De Laval Sales Engineer.

DE LAVAL *Centrifugal Blowers*

DE LAVAL STEAM TURBINE COMPANY
860 Nottingham Way, Trenton 2, New Jersey

DL 334

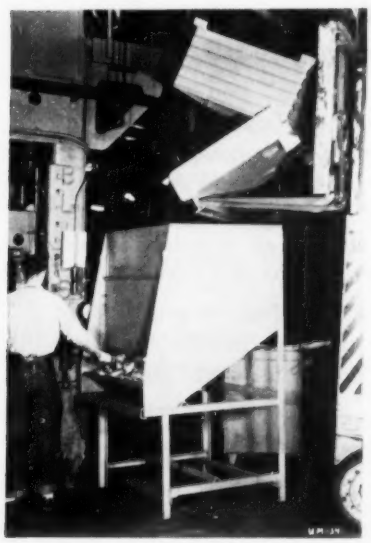
Hopper for Tight Spots

UNION Metal Mfg. Co., Canton, O., has added a gravity-fed hopper to its Work-O-Matic system of materials handling products. New unit is specially designed to provide vertical mass material supply at use point in congested areas.

The compact, portable hopper has a volume of 34.8 cu ft but occupies no more floor space than a conventional industrial container. It is 40 inches wide, 46 inches long, and 81 inches high. Front legs of the hopper are recessed under the work-level tray for closer work positioning. Tray-end is removable for fast job finish-off. Flow of material is regulated according to piece size by an adjustable control gate.

No Rehandling—Use of the compact hopper frees containers for other uses, eliminates in-process storage and costly rehandling of many materials. Fork truck idle time is reduced because the hopper can be loaded between shifts or whenever convenient. Truck operator, who acts as servicing agent and expediter, can safely dump contents of a Work-O-Matic drop-bottom box into the hopper from either side or the back.

Other Work-O-Matic products made by Union Metal are a larger gravity-fed hopper, multi-duty drop-bottom boxes and positioning stands, the multi-duty tray and the end loading scoop.



PARTS PICKED FROM TRAY
. . . truck puts more in hopper

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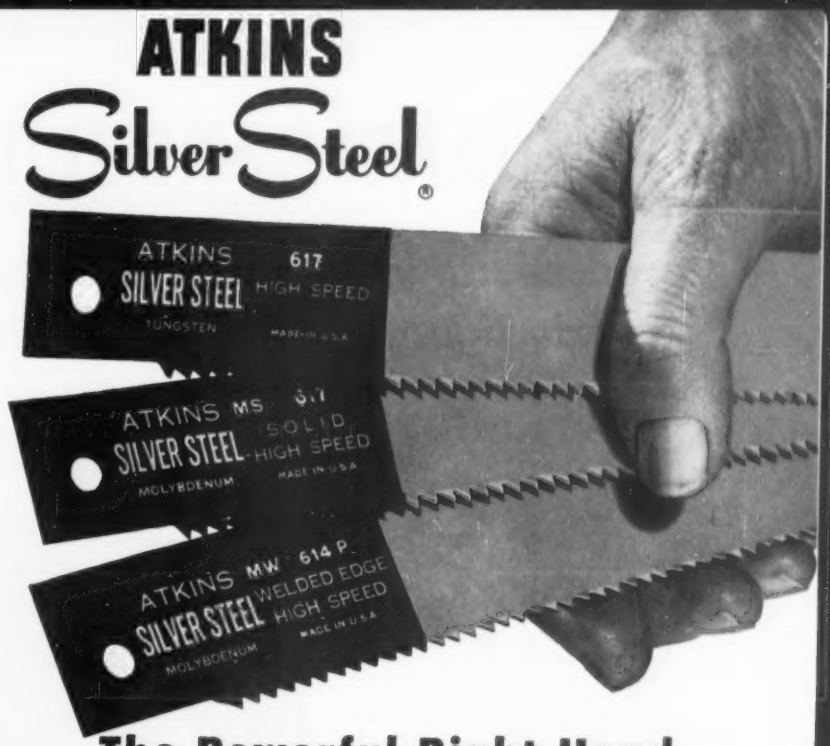

The Powerful Right Hand for All Your Metal Cutting!

Remember . . . it's the blade that does the cutting!

BUY ATKINS AND GET:

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SILVER STEEL TUNGSTEN—the choice for the toughest jobs, for fast, efficient cutting of highly abrasive materials.

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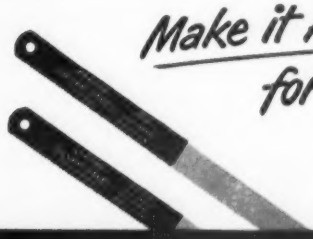
SILVER STEEL WELDED EDGE MOLYBDENUM—it's shatterproof for top production and extra life in general purpose cutting.



Make it Atkins Silver Steel® for hand cutting too!

New improvements in Atkins metallurgy and manufacturing make these *Silver Steel* hand blades ideal for the most exact cutting. They're High-Speed Tungsten and High-Speed Molybdenum, either All-Hard or Flexible Back.

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STANDARD CARBOLOY® TOOLS

CEMENTED CARBIDE

reduce inventory, increase output, cut production costs on single-point tool jobs

Standard Carboloy Tools are effectively replacing "specials" in all sizes and types of shops. Comparison records prove "Standards" consistently produce results like these: Machining costs reduced 25%; machine output increased 42%; roughing and finishing time cut 60%; inventories cut up to 40%.

JUST ELEVEN Standard Carboloy Tools – styles A to G – will do up to 80% of all single-point tool jobs . . . outlast steel tools by as much as 10 to 1. Use them "as is" for turning, facing, boring . . . or adapt them quickly to your own "specials."

By using "Standards" you'll eliminate hundreds of costly, inventory-loading special tools. You'll slash downtime to an absolute minimum. Your local Authorized Carboloy Distributor can always give you immediate delivery on all Standard Tools and blanks, insert blanks and boring tools.

Standard Carboloy Tools are available to handle every single-point tool job. Send coupon, today, for free technical literature.

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company

CARBOLOY
Department of General Electric Company
11141 E. 8 Mile Ave., Detroit 32, Michigan

Send me the following, without cost or obligation:

- ☐ Application data on Grade 370.
- ☐ "Brief-A-Log" Condensed Catalog and Price List, GT-265, with "Standard" specifications.
- ☐ Have a tool expert call to show us how to use "Standards" effectively.

Name _____ Position _____

Company _____

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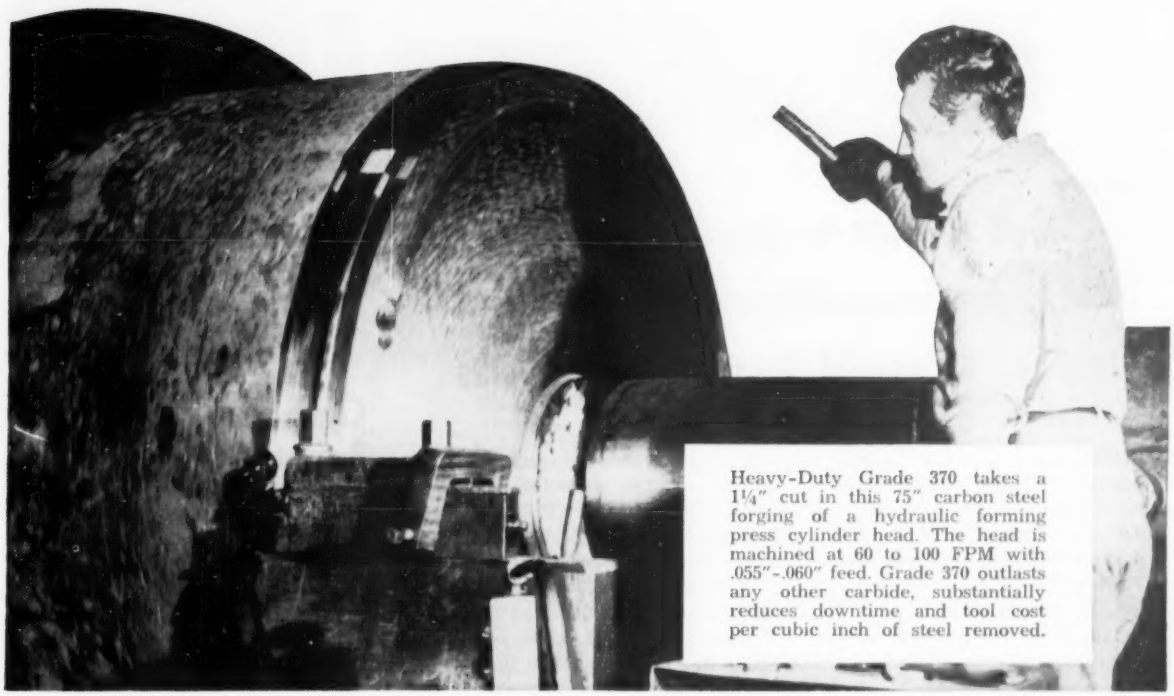
NEW CARBOLOY® GRADE 370
CEMENTED CARBIDE

cuts more cubic inches of steel per minute— with longer tool life—than any other carbide



Heavy-Duty Grade 370 takes a 1¼" cut in this 75" carbon steel forging of a hydraulic forming press cylinder head. The head is machined at 60 to 100 FPM with .055"-.060" feed. Grade 370 outlasts any other carbide, substantially reduces downtime and tool cost per cubic inch of steel removed.

NEW Heavy-Duty Grade 370 Carboloy cemented carbide was specially developed for taking heavier cuts in steel, at higher speeds than ever before practical. Grade 370 cuts more cubic inches of steel per minute – with longer tool life – than *any* existing carbide.

Other carbides fail when machining at higher speeds because the tremendous temperatures and pressures deform their cutting edges. Heavy-Duty Grade 370, manufactured by an entirely new process, has a built-in rigidity to resist this deformation, even at temperatures of around 1800° F.

Carboloy Grade 370 is being used successfully on such tough, heavy-duty applications as rolls, gun barrels and locomotive wheels. Grade 370 lasts longer than any other carbide – *increases production by as much as 30%.*

The first of the new Series 300 steel-cutting carbides, Heavy-Duty Grade 370 is available immediately in a number of sizes and shapes. Trained engineers from the Carboloy Engineering Appraisal Service will work with you on your heavy-duty cutting jobs. Send coupon, at left, for information, and for free technical literature.

CARBOLOY
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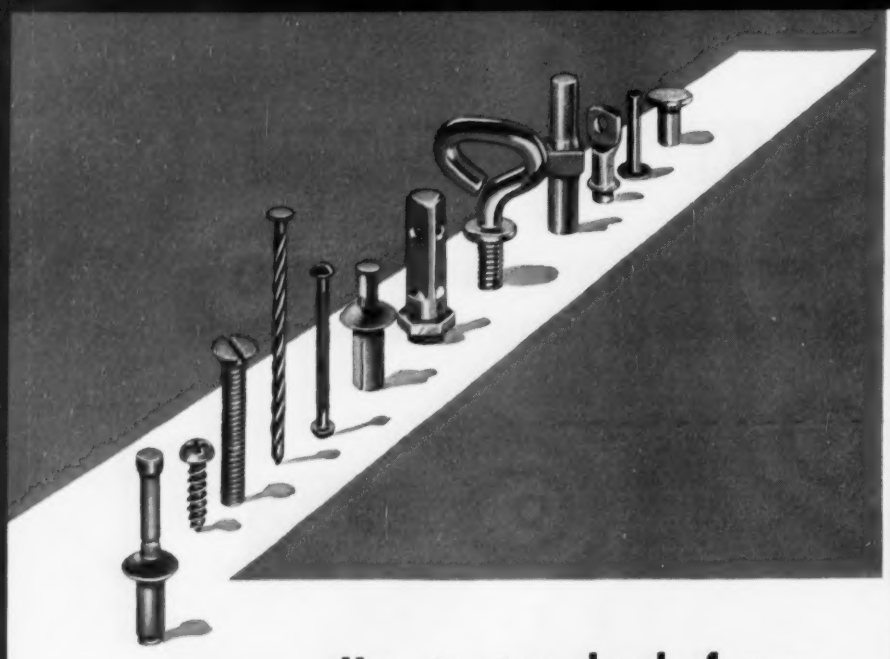


How to stay ahead of your competition with Townsend special fasteners and parts

In today's highly competitive markets many design engineers and production managers find they improve products, reduce material costs and assembly time with Townsend's method of cold-forming fasteners and small parts. It enables them to put greater value into their products and at the same time hold unit costs down.

The Townsend method often replaces costly, material-wasting methods with savings that range from $.70 to $80.00 per thousand. Annual savings are often substantial—$15,816 on an automobile door lock part—$12,000 on a washing machine fastener—$11,190 on two parts for home laundry equipment—$15,630 on two refrigerator fasteners—$5,130 on an electrical connection.

Townsend engineers specialize in the assembly and fastening of all types of materials for all industry. They draw upon more than 10,000 standard and special items developed in 138 years of cold-forming experience and rely upon Townsend's capacity to produce 60-million pieces daily to give you the best in fastening methods. To learn how to improve fastening efficiency, ask to have an engineer call.

Townsend

COMPANY • ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

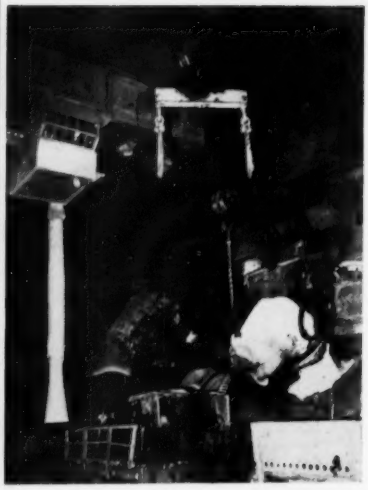
Sales Offices in Principal Cities

Cherry Rivet Division • Santa Ana, California

THE FASTENING AUTHORITY—Experience: *over 138 years*—**Capacity:** *sixty-million parts daily*—**Products:** *over ten-thousand types of solid rivets–cold-headed parts–Cherry Blind Rivets–Twinfast Screws–self-tapping screws–tubular rivets–locknuts–special nails–formed wire parts.*

Plants: *New Brighton, Pa.—Chicago, Ill.—Plymouth, Mich.—Santa Ana, Calif.*

In Canada: *Parmenter & Bulloch Manufacturing Company, Ltd., Gananoque, Ontario*



Converter Aisle Process

Impurities in the matte are separated from nickel and copper before further processing in the converter aisle at the Copper Cliff, Ont., smelter of International Nickel Co. of Canada Ltd. These converters are cylinders of steel 35 feet long, 13 feet in diameter

Compressed-Air Breaker

ARC-FURNACE circuit breaker, developed by the Westinghouse Electric Corp., is a compressed-air breaker with arc chutes redesigned. It results in interrupting capacity of 500,000 kva on 34.5 kv lines. The new design eliminates the need for a separate breaker to interrupt short-circuit currents. Tests have shown the breaker to be capable of handling the frequent routine load openings and also several primary-fault operations per year for two years with a minimum of maintenance.

Probably the roughest service any circuit breaker must face is the electric-arc furnaces. The breaker must operate frequently because of cave-ins of the scrap metal during the melt-down portion of the furnace cycle. In one typical installation an arc-furnace breaker was called on to interrupt load and overload currents 59,331 times in a 27-month period, or once every 21 minutes. By comparison, a power-system breaker is required to operate usually no more than every few months and ordinarily the contacts are examined after a few such operations.

Heretofore, in arc-furnace in-

stallations, a separate breaker has been used for interruption of short circuits. Now the furnace breaker does both jobs—frequent operation on loads and overloads and infrequent operation on heavy short circuits.

Versatile Boring Heads

SIGNIFICANT results on rough boring applications of stainless steel tubing with standard clamped tungsten carbide insert boring heads are reported by a Pacific Coast stainless steel casting manufacturer. Tubing, 74 inches in length and ranging in outside diameter from 3 to 13⅛ inches and inside diameter from 1¾ to 11⅞ inches, is being bored in one cut on medium-duty standard engine lathes.

Standard H-type Kennametal inserts are secured in the boring head with heavy steel spring clamps and buttonhead clamp screws. Two tungsten carbide wear pads on the boring head's outside diameter guide the head during the cut to assure a true bore. Boring bars are made of Shelby tubing, through which suitable coolant is forced under high pressure to wash away chips ahead of the cut.

Operational Data — For two of their most typical tube boring jobs the operations are as follows: On the first job cast stainless AISE type 420 steel tubing of 9-inch OD by 3-11/16-inch ID is rough-bored on its inside diameter to 4 inches on an Axelson 18-inch medium duty lathe.

The boring head utilized has standard Kennametal Grade K2S clamped inserts. Job is handled at 0.010-inch feed, 160 SFM at a 5/32-inch depth of cut (one side) in 55 minutes machining time. Their second job is a rough boring to 3⅛ inch of the inside diameter of cast stainless AISE tubing 6-3/16 inch outside diameter by 2⅝-inch inside diameter on an 18-inch engine lathe.

The tooling used is standard Kennametal Grade K2S clamped inserts having a parallel chipbreaker 1/32 by ⅛ inch wide. Job is run with 0.020-inch feed, 100 SFM at ¼-inch (one side) depth of cut in approximately 35 minutes machining time.

Here's free information to help you reduce material and assembly costs

If you assemble metal, wood, plastics, fabrics or glass, here is a wealth of free information which shows how to increase efficiency and improve products with Townsend fasteners. These bulletins describe a few of the 10,000 special and standard items now being used by all industry to reduce material and assembly costs.

Manufacturers of appliances, radio and TV sets, automobiles, aircraft, electrical equipment, farm implements, railroad rolling stock—even toys, rely upon Townsend as "The Fastening Authority" to help them fasten materials together quickly—economically—permanently. The bulletins listed below are yours for the asking.

- **Special Cold Formed Fasteners and Small Parts** explains the economy of cold-forming small parts and how to enjoy the advantages of Townsend's design service. Bulletin TL-89
- **Townsend Tapping Screws** describes seven types of tapping screws used for economical, quick, secure fastening of sheet metal, casting, forgings, plastics, plywood and composition materials. Bulletin TL-88
- **Townsend Locknuts** gives data on positive resistance to vibration and shock with Tufflok and Nylok locknuts which provide tight grip through use of special locking inserts. Bulletin TL-63
- **Cherry Blind Rivets** shows how this ingenious rivet is used by one man, from one side of the work to rivet "blind" in double-surfaced structures, box sections, tubes and ducts. Bulletin TL-76
- **TWINfast Wood Screws** explains how the two threads and double thread pitch cut driving time, increase holding power in wood-to-wood, wood-to-plastics and metal-to-wood applications. Bulletin TL-67
- **Place Bolts** describes this slotted-type, one-piece, all-metal, reusable locking bolt and how it offers cost savings in vibration fastening. Bulletin TL-73.

Townsend
COMPANY • ESTABLISHED 1816
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Sales Offices in Principal Cities
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Use coupon below or write
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Please send to me without obligation bulletins circled below:

TL-89 TL-88 TL-63
TL-76 TL-67 TL-73

Name _____ Title _____
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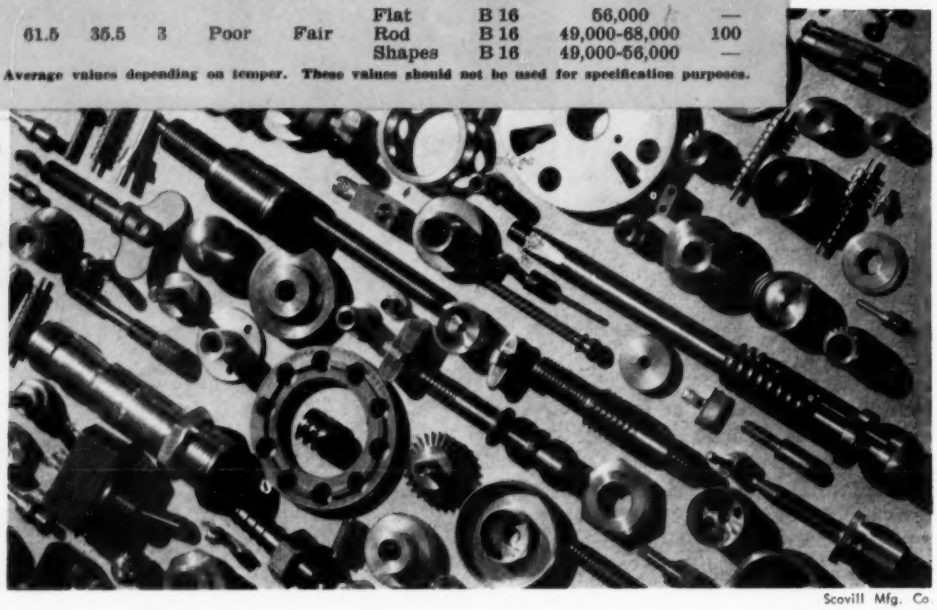
FREE-CUTTING BRASS

Alloy	Nominal Composition (Per cent) Copper	Zinc	Lead	Cold Working Capacity	Hot Working Capacity	Forms	Nearest Applicable ASTM Specification	Tensile Strength Range* (psi)	Machinability Rating
FREE-CUTTING BRASS	61.5	35.5	3	Poor	Fair	Flat	B 16	56,000	—
						Rod	B 16	49,000-68,000	100
						Shapes	B 16	49,000-56,000	—

* Average values depending on temper. These values should not be used for specification purposes.



Scovill Mfg. Co

HOW TO CLASSIFY Copper Base Alloys

Copper base alloys offer manufacturers a wide range of working properties. In machining, for example, shortness of chip and free-cutting are obtained by adding lead

Part 2

QUALITIES OF HARDNESS, stiffness and strength (not softness and pliability) are desired in countless brass products, such as screws and other shapes that are rapidly turned from rod on high-speed, automatic screw machines. Necessary shortness of chip or general free-cutting quality is secured by adding amounts of lead up to about 3.5 per cent.

Some manufacturing is favored by combining hot-working in initial processing, followed by cold-working and annealing operations that are similar to those used with plain alpha brasses. An alloy would be selected from the group of leaded brasses in the table, showing the copper and lead contents best suited to the particular series of mill and fabrication operations, of course, bearing in mind the properties desired in finishing parts.

Alloy used in greatest quantity is free-cutting brass, containing 61.5 per cent copper, 3 lead and 35.5 zinc. It can be cut at high speeds with low tool pressure. Tool wear is at a minimum and short chips clear the tool. Since free-cutting brass does not lend itself particularly well to cold-working, often required in addition to machining, a medium-leaded or high-leaded brass—or perhaps leaded Muntz metal—might be used in preference.

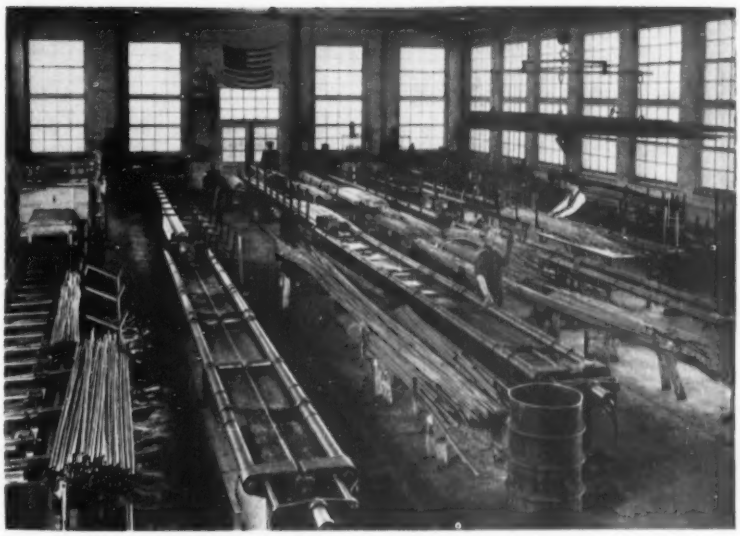
Forming—Where hot pressing or hot forging is used in shaping brass, an alloy containing nominally 60 per cent copper, 2 lead and 38 zinc (forging brass) is by all odds the favored material. It is extruded readily and can be forged into intricate shapes over a wide range of temperature. The 2 per cent lead facilitates extensive and ready machining thereafter.

In fabricating articles from strips by drawing or forming and where some machining is also necessary, various lead-bearing alloys are available, including low-leaded brass, medium-leaded brass, high-leaded brass and extra-high-leaded brass.

Choice between cartridge brass (containing no lead) and one of the four, lead-bearing brasses will depend on the relative importance of the cold-fabricating and ma-

Adapted in part from the chapter on copper in *Modern Uses of Nonferrous Metals*, by Dr. D. K. Crampton, director of research and development, Chase Brass & Copper Co. Inc., Waterbury, Conn. Work was recently published by the American Institute of Mining and Metallurgical Engineers, New York.

This is the second of three articles on the subject. First, which appeared in last week's issue of STEEL, concerned commonly used copper base alloys. Final article, to appear next week, will deal with casting alloys.



Bourdon tube is heart of a pressure gage. U. S. Gauge draws and forms its own tubing from copper alloys. Gage has thousands of applications

chining required. It is impossible to get the maximum of both qualities in any one material.

Corrosion—Of the tin and aluminum brasses, admiralty and aluminum brass are used almost exclusively for heat-exchanger tubes—primarily because of their high resistance to most conditions of aqueous corrosion. The admiralty alloy, a leader in the field many years, is now usually modified by the addition of a few hundredths of one per cent of an element from the group including antimony, arsenic, phosphorus and silver. Purpose is to inhibit dezincification.

Aluminum brass is more specifically used where water velocities are high. For instance, in marine condensers, it has been found to be highly resistant to so-called impingement attack. It also is made with an inhibitor, as is the admiralty mixture.

The plain and leaded naval brasses and manganese bronze are widely used as a high-strength, structural material with resistance to saltwater corrosion. In point of strength, the manganese bronze is distinctly superior to the naval brasses. A leaded variety of the latter is, of course, used in preference to the nonleaded one when extensive machining is necessary.

Others—Phosphor bronzes (containing 5, 8, or 10 per cent phosphorus) are the preferred alloys for springs or other uses requiring high strength, great resiliency and corrosion resistance. The 1.25 per cent phosphor bronze finds its chief use in electrical contacts, flexible hose and pole-line hardware.

Although cupro-nickels with nickel contents up to 40 per cent are often used, by far the most important is the 30 per cent nickel variety; it is presently thought to be the outstanding alloy for heat-exchanger use, owing to its exceptionally high resistance to corrosion.

The two nickel silvers listed are in demand mostly for their color, which is desired as a base for plated flat and hollow tableware, zippers, costume jewelry, nameplates and radio dials.

The silicon bronzes are general purpose, structural alloys of wide application; they combine high strength, great toughness, ease of forming, resistance to corrosion and other properties.

Temper Control—Temper of copper and copper alloys is determined by the degree of anneal, cold de-

LEADED BRASSES

Alloy	Nominal Composition (Per cent) Copper	Zinc	Lead	Cold Working Capacity	Hot Working Capacity	Forms	Nearest Applicable ASTM Specification	Tensile Strength Range* (psi)	Machinability Rating
LOW-LEADED BRASS	65	34.5	0.5	Good	Poor	Flat	B 121, Alloy 2	46,000-74,000	—
MEDIUM-LEADED BRASS	65	34	1	Good	Poor	Flat	B 121, Alloy 3	47,000-74,000	—
						Rod	—	50,000-55,000	70
						Wire	—	50,000-88,000	—
HIGH-LEADED BRASS	65	33	2	Fair	Poor	Flat	B 121, Alloy 5	49,000-85,000	—
						Rod	—	58,000	90
ARCHITECTURAL BRONZE	57	40	3	Poor	Excellent	Shapes	—	60,000	90

*Average values depending on temper. These values should not be used for specification purposes.

Copper & Brass Research Association

STANDARD COMMERCIAL WROUGHT COPPERS AND COPPER-BASE ALLOYS[a]

Name	Nominal Composition, Pct.[b]	Forms Commonly Used: Rolled Flat Products	Rod and Drawn Flat Products	Shapes	Wire (Except Flat)	Tube
Coppers:						
Electrolytic tough-pitch	Copper 99.92, Oxygen 0.04	X	X	X	X	X
Deoxidized copper	Copper 99.94, Oxygen 0.02	X	X	X		X
Plain brasses, nonleaded:						
Gilding, 95 pct.	Copper 95, Zinc 5	X	X		X	
Commercial bronze, 90 pct.	Copper 90, Zinc 10	X	X		X	X
Red brass, 85 pct.	Copper 85, Zinc 15	X	X		X	X
Low brass, 80 pct.	Copper 80, Zinc 20	X	X		X	
Cartridge brass, 70 pct.	Copper 70, Zinc 30	X	X		X	X
Yellow brass	Copper 65, Zinc 35	X	X		X	
Muntz metal	Copper 60, Zinc 40	X	X		X	X
Leaded brasses:						
Leaded commercial bronze	Copper 89, Lead 1.75, Zinc 9.25		X	X		
Low-leaded brass (tube)	Copper 67, Lead 0.5, Zinc 32.5					X
Low-leaded brass	Copper 64.5, Lead 0.5, Zinc 35	X				
Medium-leaded brass	Copper 64.5, Lead 1, Zinc 34.5	X	X	X	X	
High-leaded brass (tube)	Copper 67, Lead 1.6, Zinc 31.4					X
High-leaded brass	Copper 62.5, Lead 1.75, Zinc 33.75	X	X			
Extra-high-leaded brass	Copper 62.5, Lead 2.5, Zinc 35	X				
Free-cutting brass	Copper 61.5, Lead 3, Zinc 35.5		X	X		
Leaded Muntz metal	Copper 60.0, Lead 0.5, Zinc 39.5	X				
Free-cutting Muntz metal	Copper 60.5, Lead 1.1, Zinc 38.4					X
Forging brass	Copper 60, Lead 2, Zinc 38	X	X	X		
Architectural bronze	Copper 57, Lead 3, Zinc 40		X	X		
Tin and aluminum brasses:						
Admiralty	Copper 71, Tin 1, Zinc 28	X			X	X
Naval brass	Copper 60, Tin 0.75, Zinc 39.25	X	X	X	X	X
Leaded naval brass	Copper 60, Tin 0.75, Lead 1.75, Zinc 37.5		X	X		
Manganese bronze	Copper 58.5, Tin 1, Iron 1, Manganese 0.3, Zinc 39.2	X	X	X	X	
Aluminum brass	Copper 70, Aluminum 2, Zinc 22					X
Phosphor bronzes (tin Bronzes)						
Phosphor bronze, 5 pct.	Copper 95, Tin 5	X	X		X	X
Phosphor bronze, 8 pct.	Copper 92, Tin 8	X	X		X	
Phosphor bronze, 10 pct.	Copper 90, Tin 10	X	X		X	
Phosphor bronze, 1.25 pct.	Copper 98.75, Tin 1.25, Phosphorus tr	X				
Cupro-nickel and nickel silvers:						
Cupro-nickel, 30 pct.	Copper 70, Nickel 30	X	X			X
Nickel silver, 18 pct. (A)	Copper 65, Nickel 18, Zinc 17	X	X		X	
Nickel silver, 18 pct. (B)	Copper 55, Nickel 18, Zinc 27	X	X		X	
Silicon bronzes (copper-silicon alloys):						
Silicon bronze, 3 pct.	Copper 96, Silicon 3	X	X	X	X	X
Silicon bronze, 1.5 pct.	Copper 97.7, Silicon 1.5	X	X	X	X	X

[a]From Copper and Brass Research Association's Book of Standards.
[b]Only major elements are listed.

(Continued on p. 164)

THE BURLINGTON LIARS' CLUB

SPINS A YARN FOR **BAKER'S MAGDOLITE**

Off and Flying!

Back in the hills of Montana it really gets cold at times, but it has never been as cold as it was last winter. The mercury dropped clean out of sight. Old Zeke had a cuckoo clock that had always kept perfect time through all kinds of weather . . . but when this cold spell hit, strange things began to happen. After a day of the hard, biting cold, the cuckoo quit coming out. On noon of the third day the door cracked open . . . the cuckoo stepped out, stuttered "Goodbye" to Zeke through his cold and chattering bill, then took off and joined a flock of ducks who passed by heading south.

You won't be left out in the cold for a dependable source of dolomite if you order BAKER'S MAGDOLITE, the original dead-burned dolomite. The J. E. Baker Company has three plants, located in York and Billmeyer, Pennsylvania and Millersville, Ohio. These plants have an ample supply of BAKER'S MAGDOLITE on hand . . . assuring you always of prompt service. Remember, BAKER'S MAGDOLITE is five ways better . . . Composition, Preparation, Strength, Economy, Quality.

JEBCO PRODUCTS SINCE 1889

MAKERS OF BAKER'S MAGDOLITE

7-54

© The J. E. Baker Company

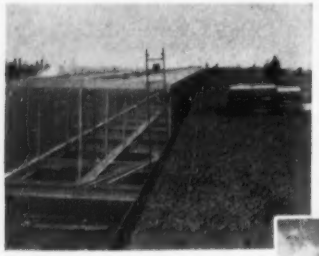
THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA

Plants: York, Billmeyer, Pennsylvania—Millersville, Ohio

You Can't Buy An Efficient Paint Finishing System Off The Shelf

It Requires Specialized Engineering Study . . . Backed By Experience



Here's the beginning of a Baking Oven Installation — MADE ON THE JOB — FOR THE JOB.

Here's a Finished Baking Oven Installation. It actually enhances the plant picture—A WORTHY CAPITAL ASSET.

Paint Finishing Systems are not "shelf" packages. In all cases, they must be designed to meet the needs and fit within the facilities where they are to be installed. The illustrations show how P-D engineers overcame problems of locating Baking Oven installations. They "took to the air"— installed them on plant roofs with conveyor feeds from other floor levels — eliminating plant expansion while increasing its capital worth.

For gaining the utmost in efficiency, economy, and surety of operation to meet your Finishing System requirements, it is most important to check your NEEDS with a firm that has the "know-how." Regardless of the size installation, it does not pay to "pick" and "choose" components separately. Peters-Dalton, with 25 years of Finishing System leadership and experience, offers expert engineering and design. P-D engineers lay out the complete Finishing System to meet whatever requirements and space limitations necessary for a satisfactory installation in your plant.

A Finishing System installed by P-D is tops in efficiency and economy because it is plant engineered and produced step by step for you and you only.

A P-D installation means one responsibility for final satisfactory results—means the performance of a Finishing System that you can rely upon for smooth, efficient, integrated operation and high quality work at lowest possible costs.

Hydro-Whirl Paint Spray Booths *Industrial Washing Equipment*
Drying and Baking Ovens *Hydro-Whirl Dust Collecting Systems*

Peters-Dalton INC.
17892 Ryan Road • Detroit 12, Michigan

Hold Tight!

Loose fasteners would be drawn into the compressor blading. Non-metallic insert type of reuseable locknut made by Elastic Stop Nut Corp. of America is used to hold end pieces to the cowl which supports the main bearing. They must, and do, stand normal vibrations of a flight plus severe shock of opening of the recovery parachute at the end of a research flight

Stator Frames: 60 per Hour

Special three-way boring, facing and tapping machine, designed for a major electric appliance manufacturer, will process eight different stator frames at 60 pieces per hour. Built by Buhr Machine Tool Co., Ann Arbor, Mich., the machine operates at a reported 80 per cent efficiency.

In the complete system, a second Buhr special takes over to mill, drill and ream the four legs and drill four conduit box holes before the new unit takes over.

Standard features included in construction are automatic way lubrication, automatic index tables electrically controlled. Components are located by dowels in holes bored to held tolerances to permit interchangeability of parts. Index tables are cam-and-roller type to assure uniform acceleration of indexing.

When stator is positioned, fixture automatically indexes 180 degrees where two opposing spindles finish bore stator hole and face rabbet bores, simultaneously tapping four conduit box holes with the tapping unit mounted on the rear. All installations are made to JIC standards.

NEW PRODUCTS and equipment

Reply card on page 141 will bring you more information on any new products and equipment in this issue

Cylinders

. . . stocked for quick service

Stock cylinders for immediate delivery in several hundred combinations of bore, stroke and mounting are available from Miller Motor. The cylinders have solid

steel heads, caps and mounting, hard chrome plated piston rods, dirt wiper seals, leakproof piston and rod seals that never require adjustment and are otherwise identical in design, construction and workmanship to the company's custom-built line. They include air and hydraulic cylinders in both cushioned and non-cushioned styles. The air cylinders are rated for 200-psi operations and the hydraulic cylinders for 2000 psi.

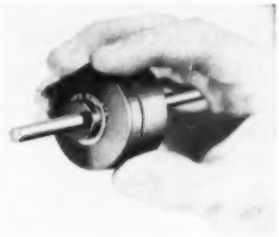
By maintaining a continual stock of these cylinders, the company can make a delivery within 24 to 72 hours from date of order. Miller Motor Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Drive Controls

. . . for low-torque drives

A completely new design and operating principle in small, compact, electric brakes, clutches and clutch-couplings for fast, accurate control of low-torque drives has been announced by Warner Electric. These replaceable face electric brakes and stationary field electric clutches are said to offer several outstanding advantages for a wide variety of power transmission applications. High-speed engagement and release, coupled with unusually high torques make the units adaptable to starting, stopping, indexing, rapid cycling, synchronizing, torque limiting, indexing and jogging and single revolution cycling applications on small, electrically operated machinery. Pushbutton or automatic operations with electric controls makes



possible design opportunities heretofore limited by slow, costly mechanical linkages plus size and weight requirements. Warner Electric Brake & Clutch Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Wire Twister

. . . for specific application

The Model G-6 Twister, designed for a specific kind of wire, gage of wire and length of twist, eliminates treadle operated jaws allowing one well-known manufacturer to increase its twisting rate from 2000 to 4000 ends of wire per hour. Funnel-type opening guides the loose strands into a special head which holds them in such a way that the rotation of the head imparts the proper twist. Each

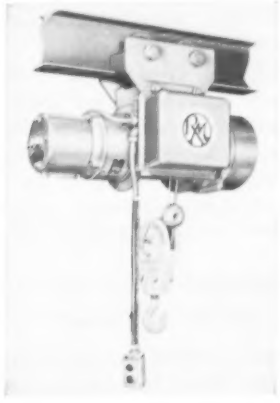
twister is developed to order and made for one particular high production twisting operation. Eraser Co. Inc.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Wire Rope Hoist

. . . 18-foot lift, no overwind

A J-3 wire rope hoist is available with either two-speed or single



speed push button magnetic control with a rated capacity of two tons. It is powered by a 2-hp to-

tally-enclosed ball bearing motor specifically designed and manufactured for hoist duty. The hoist is equipped with 2 parts of ⅜ inch cable 6 x 37 reeving. It has an 18-foot lift without overwind. Upper and lower limit switches prevent overtravel of the hook block in either direction.

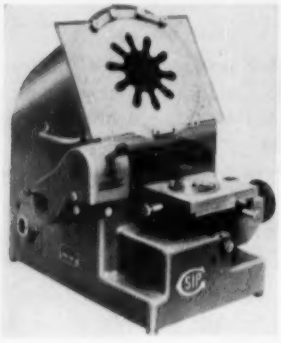
A magnetic, disc-type motor brake automatically opens when the hoist starts and closes instantly when the current is shut off, stopping the hook quickly, without drift, assuring accurate load spotting. Robbins & Myers Inc.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Profile Projector

. . . no interfering shadow

Profile projector, type AP-17, is intended to extend the application of optical control to all stages of the manufacturing process and at any place. It serves as well for gaging the silhouette in transmitted light as for inspecting the



surface of a piece by means of incident light.

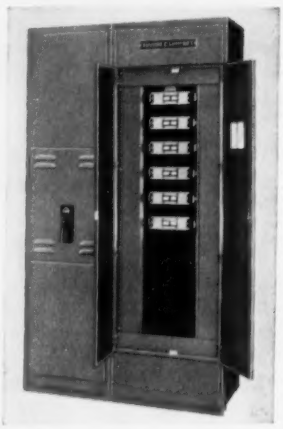
The operator is seated, while arrangement of the object table and screen eliminates continuous changes in visual adjustment. There is no interfering shadow. American Sip Corp.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Switchboard

. . . with flexible circuit

More compact construction and reserve space for future circuits are top features in the new line of switchboards for low voltage distribution applications. The line, recently introduced by Square D Co., has an isolated wiring trough which provides ample space for laying conductors. Two drop-off



openings per section assure neater and safer wiring. A flexible circuit arrangement is also standard with the new design.

Switchboard provides standardized sections for branch circuit breakers or switches and standardized sections for main incoming line equipment. The group of sections necessary to handle various components are bolted together to form a rigid switchboard assembly. Square D Co.

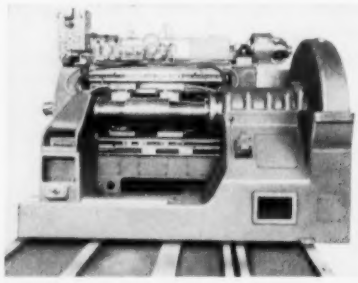
FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Gear Generator Redesigned

. . . for accuracy at high speed

The Farrel-Sykes gear generator has been redesigned to provide finer precision at higher operating speeds. The Twin-Head generator cuts gears up to 33 1/3 per cent faster, according to the manufacturer, and with higher accuracy and quality of tooth finish.

The more important design



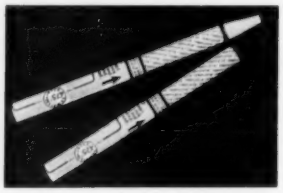
changes include: Heat-treated main spindle and massive work saddle for more rigid support of work; fully hydraulic control system; electronic speed and feed indicator for quick adjustment of the main crank; twin cutter heads with separate, shorter, stiffer spindles for each; cutters extending forward so that small diameter pinions with long shaft extensions can be more readily cut. Farrel-Birmingham Co. Inc.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Temperature Rating

. . . comes in variety of ranges

Tempilstiks° are available for 425° and 475°F. The new temperature ratings, as well as a number of



other ratings were demonstrated at the National Metal Show in Cleveland in October.

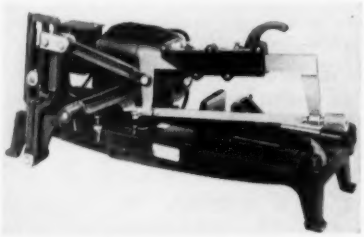
They are now available in range 113° to 400°F in 12½° intervals, in range 400° to 500°F in 25°F steps and 50°F intervals from 600° to 2000° F. Tempil Corp.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Portable Power Hacksaw

. . . unit is ready to operate

A portable power hacksaw has been developed for both heavy industrial and shop use for cutting steel, tool steel, channels, pipe, conduit, aluminum, brass and bronze by La-Roy Industries. It



is portable, having a patented mechanical motion providing cutting action on the forward stroke of the blade. Automatic lift and release of pressure on the return stroke, assures accurate cool dry cut on any metal without the use of cooling compounds. It also has

HOW A BIG NAME MANUFACTURER SAVES 80% IN MAN HOURS —PLUS

JOB FACTS:

SIZE—½" diameter, 1½" long

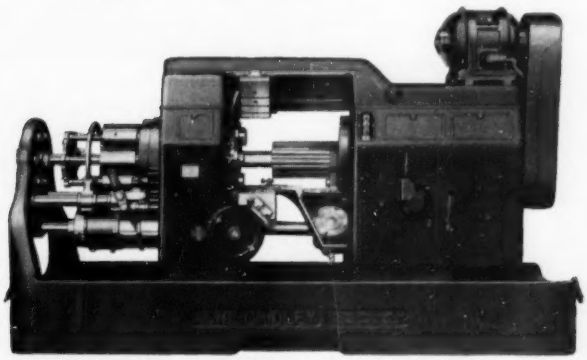
MATERIAL—C-1137 Steel

OPERATIONS—13 including 2 spindle stoppers and pick-off attachment

MACH. TIME—13 seconds

—makes this precision finished steel spindle, completes its 13 different operations in 13 seconds on a 9/16" Acme-Gridley Bar Automatic.

By previous methods the three major screw machine operations required 3 different machines—one for blanking the part, another for milling the spiral oil groove, another for double slotting the end.



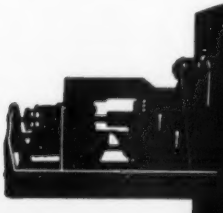
ACME-GRIDLEY 6 SPINDLE BAR AUTOMATIC
Built in 8 different chuck capacities—from 9/16 to 4"

The difference in time for the job—in man hours alone—results in a labor saving of 80%. Value of floor space, cost of extra secondary operation machines, and extra overhead are not figured in.

What "plus" factors? All burrs at oil groove, in slots, on the radiused cut off, are removed on the automatic, by precision shaving the piece all over. The slots are held within .005 of a 90° center line and the collet radius to .0005 concentricity. This single setup eliminates the errors that creep in when it is necessary to rechuck the job, minimizes inspection and scrap loss, insures precise duplication, but adds nothing to the machining time.

At a distance we can demonstrate superior performance only by such examples of completely controlled cycle time and ingenious tooling combinations that apply also to your bar machine work—to save you man hours, reduce your costs or give you a better product. So again we say—

Industry can't do **TODAY'S** job—with **YESTERDAY'S** tools
. . . and make a profit **TOMORROW**



The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

ACME-GRIDLEY BAR and CHUCKING AUTOMATICS • 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • Limit, Motor Starter and Control Station Switches • Solenoids • Contract Manufacturing.

"Most Efficient Yard Crane We've Used"

Says

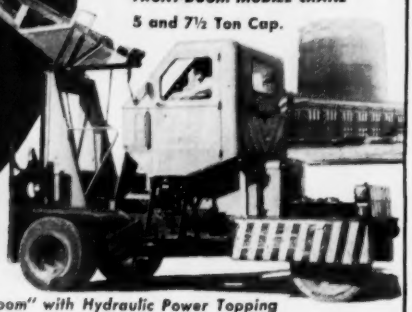
Henry J. Hettinger

Asst. Supt. in Charge of Maintenance Greenpoint Works Brooklyn Union Gas Co.

KARRI-GO

FRONT-BOOM MOBILE CRANE

5 and 7½ Ton Cap.



FEATURE: "Live Boom" with Hydraulic Power Topping

"Our KARRI-GO saves us time and money," says Mr. Hettinger. "The short turning radius makes it very flexible. It does many jobs faster, more economically than our three big cranes. We use it indoors and outdoors . . . for removing and installing underground cable, 12" pipe, valves, large valve bonnets and gates. On repairs, the KARRI-GO carries motors, speed-reducers, compressors, pumps, and other machinery to and from the machine shop. Handles reels, 55-gal. drums, steel beams and forms; it loads and unloads trucks; stacks materials for storage. This KARRI-GO has to cover a lot of ground . . . the area of our yard is over 115 acres. To carry bigger loads and cut down travel trips, we often attach a trailer to the pintle hook. Doing a fine job here."

Send for Bulletin #73C

Mfrs. of KRANE KAR Swing-Boom Mobile Crane

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

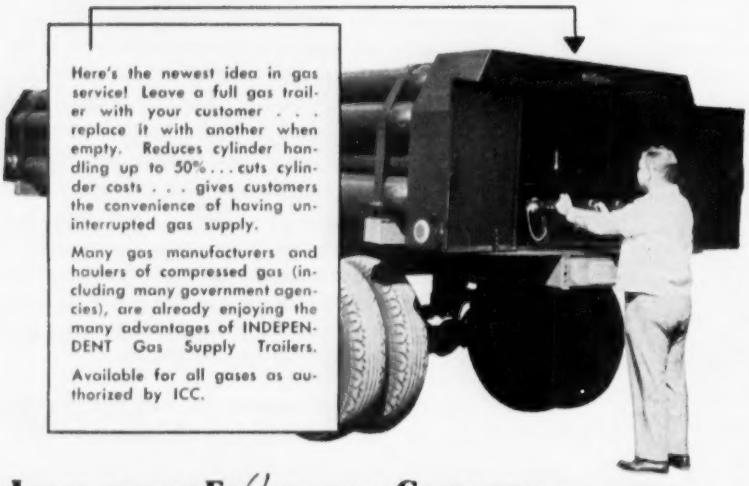
REDUCE CYLINDER HANDLING

Up to 50% with INDEPENDENT Gas Supply Trailers!

Here's the newest idea in gas service! Leave a full gas trailer with your customer . . . replace it with another when empty. Reduces cylinder handling up to 50% . . . cuts cylinder costs . . . gives customers the convenience of having uninterrupted gas supply.

Many gas manufacturers and haulers of compressed gas (including many government agencies), are already enjoying the many advantages of INDEPENDENT Gas Supply Trailers.

Available for all gases as authorized by ICC.



INDEPENDENT ENGINEERING COMPANY, Inc.

CONSULTING · RESEARCH · DESIGNING

Manufacturers of CYLINDERS AND GAS PRODUCING EQUIPMENT ACETYLENE · OXYGEN · HYDROGEN · NITROGEN

O'FALLON 6, ILLINOIS

We Invite Your Inquiries

NEW PRODUCTS and equipment

an automatic stop that permits the operator to set the saw to the desired cut and attend to other work during the cutting operation.

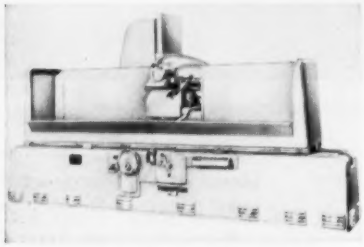
The Dymond weighs only 65 pounds and requires no bolts or clamps to hold it to the bench. It has a quick action vise that holds stock up to 2¾ in., adjustable to 15, 40 or 45 degree angles. La-Roy Industries Inc.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Surface Grinder

. . . insures accurate grinding

Some of the principal features of the new line of production surface grinders are: 20 inch diameter wheel cross feeding with horizontal spindle and grinding with periphery of wheel; patented antifriction elevating nut to eliminate windup between nut and screw; power elevation and hydraulic rapid traverse with safety stops; in-



position wheel truing. The machines are designed for faster, more accurate and economical grinding of parts from a tool steel broach bar to a machine tool way.

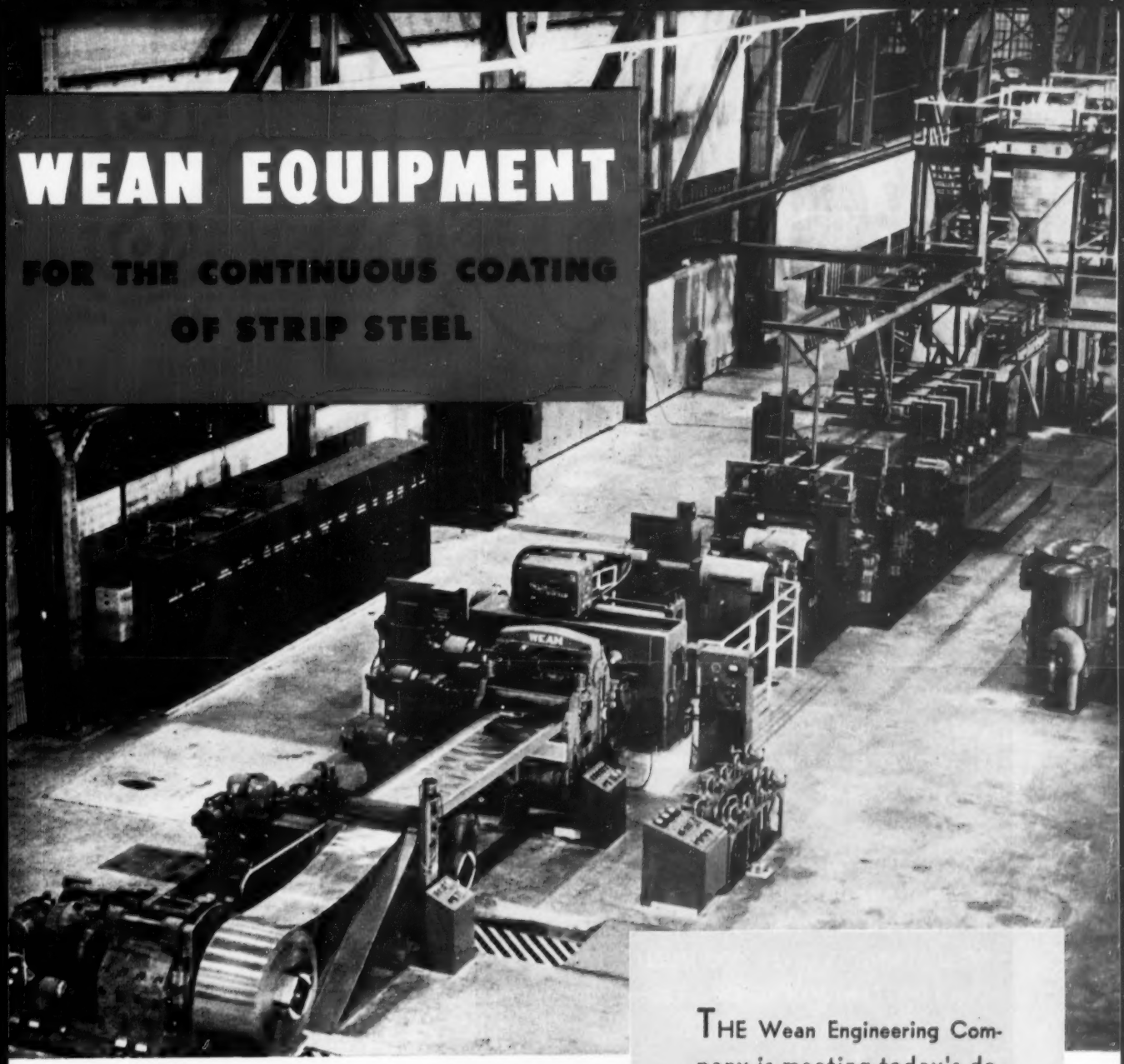
Automatic down feed; micrometer backup stop; dust exhauster; coolant through wheel; electric double angle wheel truing are some of the features available as auxiliary equipment. Thompson Grinder Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Lifter

. . . handles 20,000 pounds

A new lifter, designed by Fisher Body Div. of General Motors in conjunction with Cullen-Friestedt engineers, is capable of handling up to 20,000 pounds of sheet or coiled steel stock. Similar in design to standard C-F lifters, it incorpor-



WEAN EQUIPMENT

FOR THE CONTINUOUS COATING OF STRIP STEEL

THE Wean Engineering Company is meeting today's demands for equipment to produce tin plate and zinc coated strip steel with light coatings by the electrolytic method; also equipment to produce chemically treated black plate and strip steel. Equipment for coating strip steel with zinc and other materials by the hot dip method is also available.

The WEAN ENGINEERING COMPANY, Inc.

WARREN ---------- OHIO

Associate Company—Wean Equipment Corp.—Cleveland, Ohio

SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT

"There's more to this than meets the A.I.S.I."

Micro Rold STAINLESS SAVES YOU MONEY BECAUSE OF *Micro Rold's* SUPER-ACCURACY— AND WE CAN PROVE IT!

You purchase stainless sheets on a weight basis. You order by gauge number, with permissible A.I.S.I. thickness variation plus or minus 10%. A standard 18 gauge 36"x120" sheet, with theoretical weight of 63.00 pounds, could permissibly vary between 59.22 and 65.52 pounds —and if you order 18 gauge, needing about .0475" thickness, you may receive sheets .052" thick. But MICRO-ROLD STAINLESS GIVES YOU MUCH BETTER CONTROL OVER THIS FEATURE FACTOR . . . MicroRold may be kept within a 3% tolerance.

MicroRold Stainless Sheets may be ordered by gauge number, and you may specify that they be rolled on the "light side" of the gauge range. Special equipment at Washington Steel makes possible more accurate control of thickness — and you save money.

Ask your steel warehouse distributor for details on MicroRold Stainless. It may mean the difference between profit and loss on your next job!

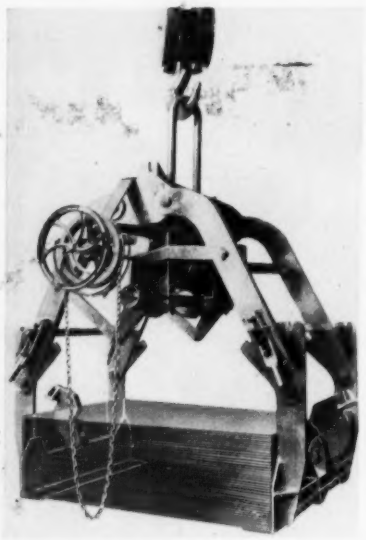
Washington Steel CORPORATION

WASHINGTON, PENNSYLVANIA

NEW PRODUCTS and equipment

ates a hinged coil-bearing segment at the center of each carrying angle.

A wide range of sheet and coil stock may be handled by the lifter because it has a number of opening and closing adjustments of the jaw. Adjustment for handling different widths of sheet and coil



stock is made in a few seconds. Positive jaw controlling mechanism holds the jaws open in desired position, speeding handling. Variations of the lifter to meet specific requirements are made. Cullen-Friestedt Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Milvise

. . . driven by a hydraulic foot

A device that will hold work in a solid grip while operations are being performed and which can be mounted on machine or bench is manufactured by Studebaker Machine. The milvise holds work with hydraulic pressure from a few pounds to 5 tons. The pres-

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

Yours FOR THE ASKING

TEAR OUT CARD, FILL IN and MAIL TODAY!

61. Casting Impregnation

Polyplastex International Inc.—An 8-page booklet on the subject of casting impregnation emphasizes the fact that the use of this system to assure density and increase the pressure tightness of castings is not a method of salvage of inferior or defective units. Booklet is illustrated and includes several case histories.

62. Speed Reducers

Eberhardt-Denver Co. — Catalog 1006 shows the complete line of worm gear speed reducers including the unique, new poweRgear reducer which offers more horsepower per dollar. Contains engineering information regarding selection of reducers, horsepower and torque calculations and service factors. 48-pages, well-illustrated, diagrams.

63. Hole Punching Units

Wales-Strippit Corp.—New bulletin describes JD hole punching units. Punches are designed to punch mild steel up to ¼ inch thick and can be used and re-used in unlimited setups. The 4-page bulletin diagrams the 2½-inch-wide and 3-inch-wide JD units and the hole punching units. It also gives standard punch and die sizes for round holes on each.

64. Automatic Filters

Dollinger Corp. — 12-page illustrated bulletin No. 500 describes Staynew Automatic Filters designed for large air volume and high efficiency. The bulletin contains specifications, engineering and performance data covering automatic filters in a wide range of sizes for handling any desired air capacity.

65. Emulsion Cleaners

Turco Products Inc. — Literature (A-106) on a new emulsion cleaner line includes an "emulsion cleaner reference chart." Material shows specific industrial uses, maximum and minimum dilution ratios, diluents used, methods of application, flash points and safety factors of each of the emulsion cleaners.

66. Machinery Supply

Alten Foundry & Machine Works Inc.—Alten offers an 8-page brochure describing their facilities as suppliers of parts and assemblies for machinery. Their structural departments, machine shop and foundries are covered, with a description of two operating locations.

67. V-Belts

Raybestos-Manhattan Inc. — The R/M Super-Power V-Belts are described in a 7-page folder issued by Raybestos. The folder claims a 40% increase in horsepower capacity over standard belts, plus resistance to shock loads and length stability. A complete list of sizes and numbers applicable to the belts is a main feature of the catalog. Nine advantages are outlined in detail.

68. LPG Engines

Twin Coach Co., Fageol Products Division—Complete line of commercial Fageol LPG engines for operation on low-cost propane or butane fuels is described in a 6-page bulletin. Horizontal and vertical models of the 404, 451 and 477 engines are included. Bulletin L-8679 is illustrated with photographs, cutaway and section views, horsepower and torque curves, dimensional drawings and condensed specification data.

69. Profilometer

Micrometrical Manufacturing Co.—An 8-page illustrated bulletin on the Profilometer for measuring surface roughness is announced by Micrometrical. The bulletin describes and

STEEL
Penton Building, Cleveland 13, Ohio

2-8-54

Please send literature or detailed information on subjects circled at left to—

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COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY AND STATE _____

This card MUST be completely filled out. Please TYPE or PRINT

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STEEL
Penton Building
Cleveland 13, Ohio

Readers Service Dept

illustrates the operating features from the user's standpoint, and explains the why's and how's of the instrument's versatility. It also tells how the machine can be used in the shop for production and quality control and shows typical applications in well-known plants.

70. Flexible Coupling

Lovejoy Flexible Coupling Co.—A 29-page catalog circulated by Lovejoy describes their complete line of flexible couplings. Fully illustrated, the catalog contains specifications and dimensions for each type plus operating capacity in hp and varying rpm. Side view and end view are given for each coupling described. A section is devoted to a varying or pulsating load conversion table for use where the motive power or the load is varying or pulsating. A typical problem is solved.

71. Floor Paving

Metropolitan Brick Inc.—Specifications and information covering the use of vitrified paving brick for accident free, cost-saving industrial floors are included in this manual ready for distribution. Special section sets forth tested procedures for laying modern brick floors. Also included are detailed data on foundations and fillers for floors in steel mills, chemical plants, the food processing and dairying industries and similar places where floors are subjected to continuous hard usage. Illustrated with more than 50 actual installation photographs.

72. Carbide Burrs

Pratt & Whitney—P. & W. has just released a catalogue prepared to describe Kellerflex carbide burrs. Its 19 pages are devoted to types, standard sizes in inches and burr numbers. A section is given to a description of special carbide burrs and the Series M and J-O flexible shaft machines and their specifications. Fully illustrated.

73. Cylindrical Grinding

Landis Tool Co.—First printing of a handbook filled with information relative to reducing cylindrical grinding costs, improving quality and training operators is announced by Landis. It contains information for operating executives, methods men, engineers, supervisors, operators and apprentices. 17 chapters, 36 pictures, tables and charts make data easy to read. Cover is varnished for long wear.

74. Scale Models

Knight Models Inc.—A four page folder discussing the uses of three dimensional scale models in business and industry is offered by this manufacturer. It describes their application in plant layout, site development, architectural and structural planning, product development and as sales aids. Illustrated.

75. Surface Grinding

DoAll Co.—"Techniques of Surface Grinding", a full color educational film dramatically presenting new techniques of precision surface grinding never revealed before is available on loan. The film explains operating techniques that assure control of dimension, form and finish in grinding. It summarizes the latest and relatively unknown applications explaining how surface grinder design and operation are coordinated for maximum performance.

76. Wire Rope Service

H. K. Porter Inc.—Seventeen tips for improving wire rope service are given in a folder distributed by H. K. Porter. "How to Get More Work Out of Your Wire Rope" contains suggestions for correct handling and storing and recommendations for proper use of rope. Brief but pertinent.

77. Liquid Measuring

Minneapolis-Honeywell Regulator Co.—Bulletin 1160 describes a dozen different Honeywell systems for measuring and controlling liquid level. Contains a brief general section on measurement, transmission and control; also handling of difficult liquids. A two-page tabulation of twelve systems for quick comparison is contained in the 24-page bulletin. Diagrams and tables.

78. Alloys Catalog

American Manganese Steel Div., American Brake Shoe—A 48-page, 2 color catalog just published contains a list of American's complete line of hardfacing and build up rods and electrodes. Typical applications are shown in over 70 photographs and full metallurgical and physical properties are included for the four

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4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
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8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

STEEL 2-8-54
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automatic and fifteen manual rods and electrodes. Charts and photographs will help select the correct hardfacing rod for unusual or hard-to-solve wear problems.

79. Welding Jigs and Fixtures

Reed Engineering Co. — A catalog covering Reed's complete line of welding jigs and fixtures presents equipment and several new machines particularly designed for the tank fabrication field. 16 pages.

80. Die Casting

Cleveland Automatic Machine Co. —A 4-page brochure issued by Cleveland Automatic Machine describes the Model 50 and Model 100 die casting machines, the two smallest in the line. It is illustrated and also gives general specifications of the machines.

81. Dust Collecting Units

Vulcan Tool Co.—A brochure issued by Vulcan describes the new individual Vulcanaire Dust Collecting Units. Discussed are the practical individual dust collectors, Vac-Dust collecting units and Vac-Suction pick-up or holding devices. 4-pages, illustrated. Includes price list.

82. Water Hardening

Firth-Sterling Inc.—Two new steel catalog sections have been released on Firth Sterling Best, a water-hardening, carbon tool steel and Firth-Sterling FS 2-5, a medium tungsten, vanadium-cobalt high speed steel. The catalogs contain complete information as to typical analysis, characteristics, typical applications, forging, general heat treatment, annealing, hardening and tempering data.

83. Magnetic Motor Starters

General Electric Co.—The latest information on motor starters and pushbuttons is contained in a publication put out by General Electric. The six page, two-color bulletin, GEA-6061, provides buying information on a-c magnetic motor starters (1/6 to 50 hp), a-c combination starters (½ to 25 hp) pushbutton stations, a-c manual motor starters, and magnetic reversing controllers. In addition to rating and suggested prices, the bulletin contains photos of equipment, circuit diagrams and brief appication data.

84. Pitch Knurling

Reed Rolled Thread Die Co.—This company has prepared a booklet entitled "Circular and Diametral Pitch Knurling" incorporating engineering

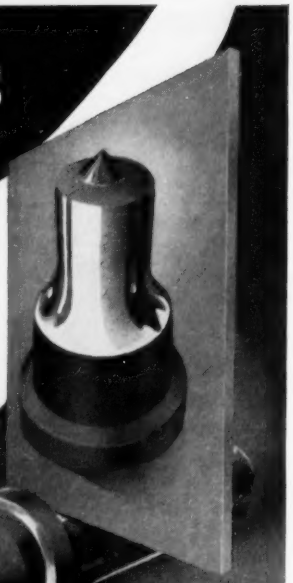
Jewel Brand
ABRASIVE BELTS

for grinding, sanding, polishing —
metal, wood, leather, plastics, rubber.

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85
Massachusetts

PUNCHES

DIES · RIVET SETS
COMPRESSION
RIVETER DIES

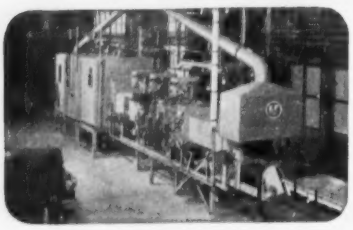


Made of highest standards and uniform quality thus insuring maximum service.
Since 1903

Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. A for Catalog 46

GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET · CHICAGO 8, ILLINOIS



A Special Atmosphere Belt Conveyor Electric Furnace Annealing Short Lengths of Alloy Tubing—Operates at Temperatures up to 2040° F.

EF Gas Fired Forced Convection Continuous Roller Hearth Special Atmosphere Furnace Bright Annealing Long Straight Lengths of Tubing.

ANNEALING TUBING BRIGHT and CLEAN *Continuously*

Straight Lengths of Tubing up to 5" in Diameter and ¾" Thick Are Also Annealed In This EF Forced Circulation Roller Hearth Furnace.

We have built many outstanding production furnaces for processing copper, brass, stainless, aluminum, nickel, silver and other ferrous and non-ferrous tubing — in large and small coils—straight lengths, long and short, and in various diameters — also for wire, strip and many other products and processes.

Put your production furnace problems up to experienced engineers—IT PAYS.

Gas-Fired, Oil-Fired* EF *and Electric Furnaces
for any Process, Product or Production
THE ELECTRIC FURNACE CO.
WILSON ST. at PENNA. R. R. *Salem - Ohio*
Canadian Associates ● CANEFCO LIMITED ● Toronto 1, Canada

data to provide a source of condensed technical information on knurling, for design and process engineers and those actively engaged in the application of the process. 21 pages of detailed information, diagrams and tables.

85. Melting Furnaces

Lindberg Engineering Co.—A bulletin with photographs, specifications, diagrams performance and other technical data has been issued by the Melting Furnace Div. of Lindberg on its line of Simplex melting furnaces. 4 pages.

86. Steel Strapping

U. S. Steel Corp.—Gerrard Steel Strapping Div. has published a brochure describing uses of its heavy duty flat steel strapping system. Photographs show various models of strapping equipment and auxiliaries available. Necessary technical data are listed. 8-pages, illustrated.

EDITORIAL REPRINTS:

87. Powdered Metals

Dr. Allen Gray, Technical Editor gives an up-to-date review of what users are doing with powder metal processes. When given proper application, astounding savings result. Variety of applications made, with the surface barely scratched.

88. Automation

Solution of the critical downtime problem is in the offing says Ralph E. Cross, Cross Co. In an article written for STEEL, he says that banking of parts between operations will help and, as a result, automation will spread to new applications.

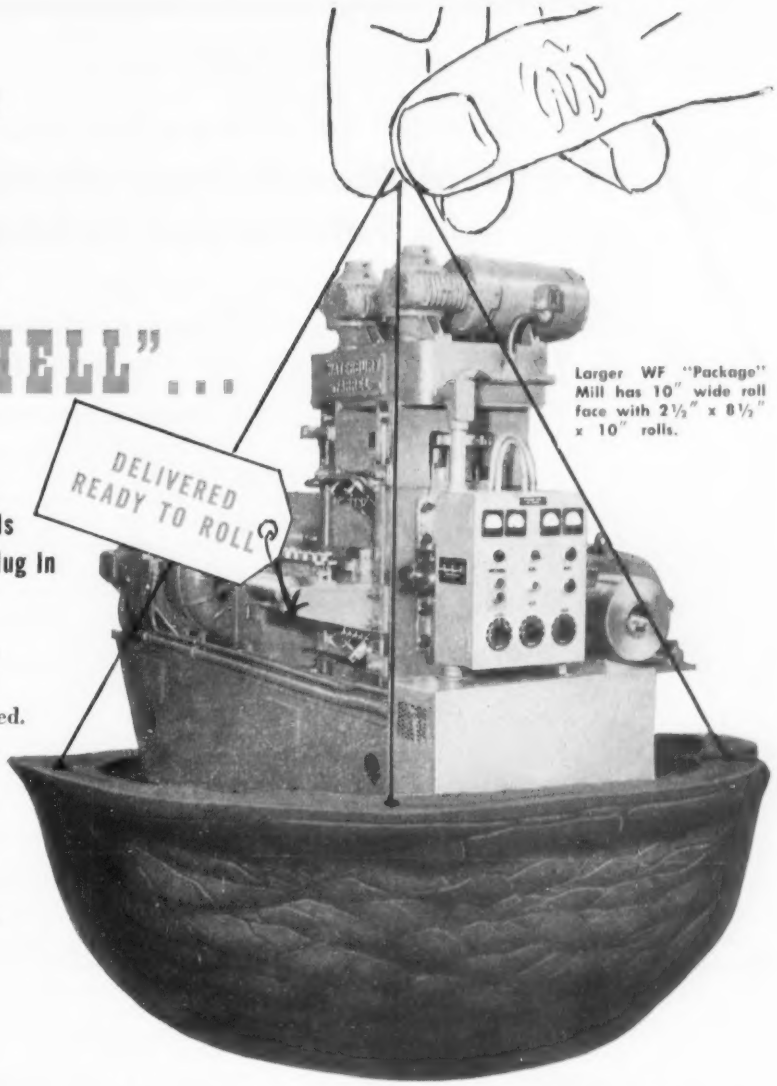
89. Floor Maintenance

Since floors are a major capital asset, A. L. Sodergreen, West Disinfecting Co., has drafted a simple maintenance chart showing general requisites for keeping the 12 common floor types in top shape. He maintains, in this article for STEEL, that, expense and need for replacement would be cut down with proper care and floor maintenance.

90. Fire Fighting

Extinguishing equipment at three potential trouble spots will protect in-line hardening and tempering machine, says a staff-written STEEL article. Allen Mfg. Co. installed such a CO_2 system that will snuff out fires in a hurry.

Waterbury Farrel's New, ONE-PIECE STRIP MILL "IN-A-NUTSHELL"...

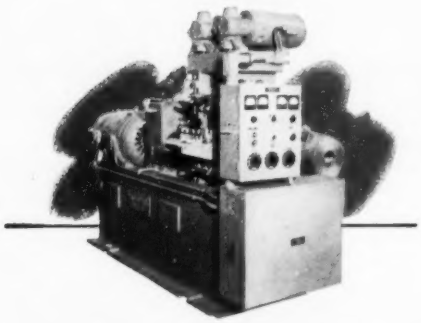


Larger WF "Package" Mill has 10" wide roll face with 2½" x 8½" x 10" rolls.

WF's 4-High "Package" Rolling Mills Are Compact, Low Cost, Ready To Plug In

You can start precision-rolling ferrous or non-ferrous strip as soon as you plug in the electrical connection.

This mill is completely self-contained. Drive, gear case, controls, lubrication system, winder and winder drive are assembled with the mill, itself, into a single, compact unit. When necessary, it can easily be moved in one piece to a new location.



Smaller WF "Package" Mill his 6" wide roll face with 1⅝" x 6½" x 6" rolls.

Some Construction Features: Mill frame of unit welded plate steel gives maximum strength and rigidity . . . assures greater accuracy and lasting alignment . . . alloy steel work rolls mounted in needle bearings . . . alloy steel back-up rolls drilled for water cooling, mounted in double row Timken bearings with tapered sleeve . . . independent power screwdowns . . . long and short roll necks and staggered couplings permit heavier construction for maximum torque capacities . . . lucite cover on welded steel gear case facilitates inspection . . . variable speed tension control drive, using AC power, cuts control cost and permits compact panel.

Contact Waterbury Farrel for complete details. No obligation.

WATERBURY FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

Offices: **Chicago, Cleveland and Millburn, N. J.**

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

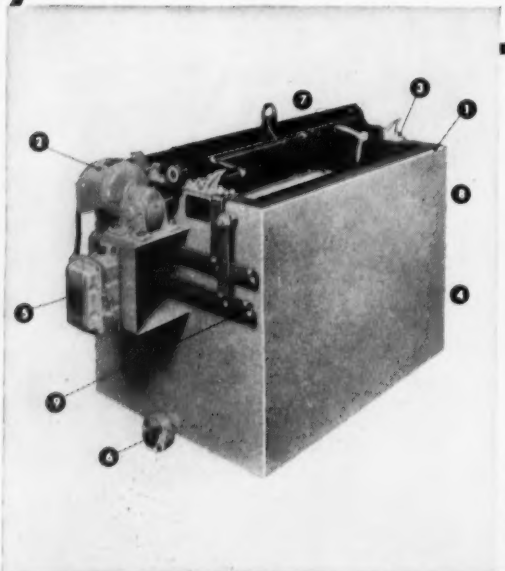
MILL MACHINERY—Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. *WIRE MILL EQUIPMENT*—Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers Swagers • Bull Blocks • String-up Machines • Spoolers, etc. *COLD PROCESS BOLT & NUT MACHINERY*—Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc. *POWER PRESSES*—Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc.

WATERBURY FARREL FOUNDED 1851

WF-17

NOW... this improved
H-VW-M Mercil-Type Plating Tank *with* Submerged Cylinder

plates faster
reduces maintenance cost
permits larger loads

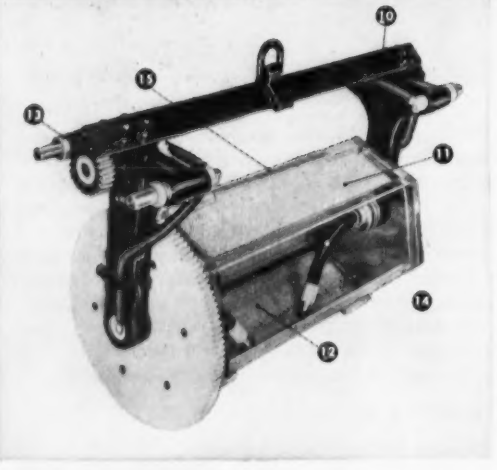


by combining *all* these features for better barrel plating:

1. **TURNED-IN FLANGES**—save space, provide enclosure for hanging heating and cooling coils.
2. **RELOCATED, MORE COMPACT MOTOR DRIVE**—drive shaft *now* above solution level, preventing leakage through shaft openings in tank walls.
3. **REDESIGNED SADDLES**—make barrel positioning far easier.
4. **NO OVERFLOW TROUGH**—not essential with this improved design, saves space inside tank.
5. **PUSH-BUTTON TYPE MOTOR STARTER**
6. **BOTTOM DRAIN**
7. **COIL RISERS**—extending over top of tank.
8. **ANODE RODS**—2 for each cylinder on both single and multiple units.
9. **BUS BARS**—positive and negative on *each* end of tank for equal current distribution.

These *improved* tanks are constructed of ¼" double-welded steel plate in 2 sizes, 14" x 30" I. D. (224 gal.) and 14" x 36" I. D. (252 gal.). For acid solutions, tanks are lined with ⅜" vulcanized rubber or plasticized PVC. For cyanide solutions, rough-wire glass is used in back of anodes. Finish is rust-resistant grey enamel with black trim.

TOGETHER, *They Form the Ideal Combination for Better Barrel Plating!*



10. **IMPROVED HANGER ASSEMBLY**—now made of rigid angle-iron, improved to insure proper barrel alignment.
11. **ONE-PIECE PANELS**—Plexiglas: ½" thick, no ribs. Melamine: ¼" thick, ribbed.
12. **CONVEX TUMBLING SURFACES (Plexiglas only)**—for added strength, easier tumbling action.
13. **MELAMINE BUSHINGS**—for insulating bronze hanger pins.
14. **EASY LOADING & UNLOADING**—cover with handle in panel area is easily reached at all times.
15. **SECURE BONDING**—all molded parts firmly bonded with cement and monel screws.

These *improved* cylinders are available in either Plexiglas, for temp. to 180°F., or Melamine, for temp. of 200-210°F. (Melamine has excellent resistance to abrasion). Hexagonal in shape, with 1" thick heads and special convex (Plexiglas only) one-piece panels, they are designed for greatly reduced maintenance cost and engineered for use *completely submerged* . . . with outstanding results: more consistent plating, 20% higher load capacities, 25% faster plating. And, in zinc baths, total submersion minimizes chance of spark igniting gas above bath.

For complete information on improved H-VW-M Mercil-Type Tanks and Cylinders ask for Bulletin PB 109.

PLATEMANSHIP

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING CO., MATAWAN, N. J.
PLANTS AT: MATAWAN, N. J. • ANDERSON, INDIANA
SALES OFFICES: ANDERSON • BALTIMORE • BOSTON CHICAGO • CLEVELAND • DAYTON • DETROIT • GRAND RAPIDS • LOS ANGELES • LOUISVILLE • MATAWAN MILWAUKEE • NEW YORK • PHILADELPHIA • PITTSBURGH ROCHESTER • SPRINGFIELD (MASS.) • STRATFORD (CONN.) UTICA • WALLINGFORD (CONN.)

H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

NEW PRODUCTS and equipment

(Continued from p. 140)

sure is obtained by a foot-operator equipped with applicator pedal that moves rear jaw of the vise forward to grip work. Another pedal applies pressure to maximum and the third breaks pressure; the jaw automatically moves back for release of work. This leaves the operator's hands free to

guide work and safety is obtained through fully hydraulic system. Studebaker Machine Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

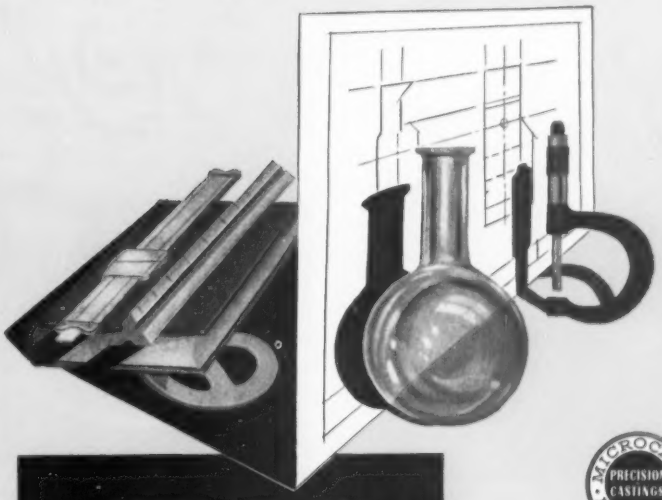
Welding Positioner

. . . 360-degree adjustment

A holding fixture for production and welding operations, the Magic Positioner consists of three 45-pound pull, neoprene covered,

Alnico V permanent magnets. Magnets are held in a die-cast, high tensile aluminum frame and have full 360 degree adjustment,

A Message to Production and Design Engineers



CUT COST

Small Parts Precision Cast by microcast

MICROCAST PRECISION CASTINGS PROCESS

The MICROCAST Process of investment casting offers a flexibility in meeting design problems not possible in the past without pyramiding costs. Small parts may be designed and Microcast for economical production eliminating such operations as broaching, contour milling, grooving, and slotting. Intricate shapes, having sound structure and surface smoothness, can be Microcast with such dimensional uniformity that little or no machining is required. Write for illustrated booklet and also complete information. New Microcast color movie available for your showing.

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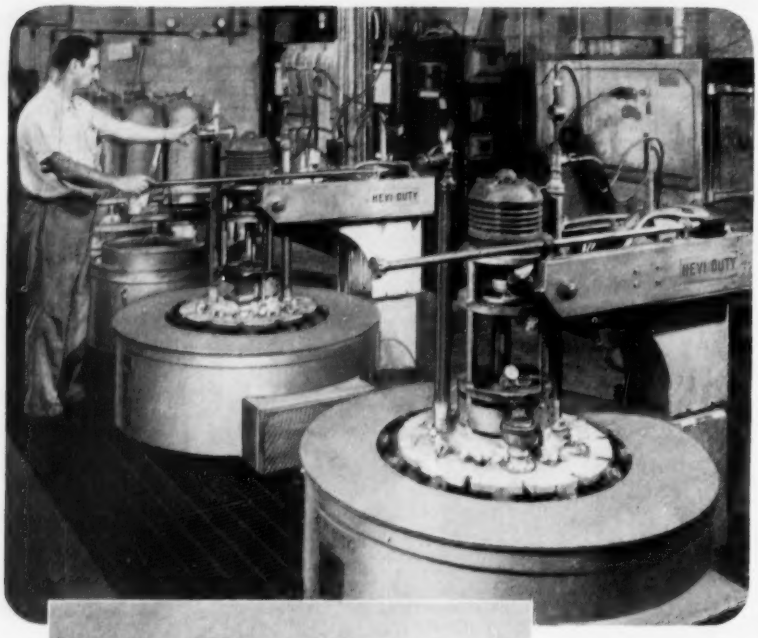
MICROCAST DIVISION, Austenal Laboratories, Inc.
224 E. 39th Street, New York 16, N. Y.
7001 South Chicago Avenue, Chicago 37, Ill.

The Original Process for Mass Producing Precision Investment Castings



Typical parts heat treated in Hevi Duty furnaces at the Union Special Machine Co.

UNION SPECIAL
***heat treats* precision parts in**
HEVI DUTY FURNACES

● Over 100 different heat treating operations are represented in one Union Special industrial sewing machine. All the carburizing, dry cyaniding and bright annealing of precision ground shafts, bearings, journals, castings and eccentrics is done in versatile Hevi Duty Vertical Retort Furnaces.

Walter Weinwurm, chief metallurgist at Union Special, says "Our Hevi Duty furnaces do an exceptionally good job of heat treating precision parts. The work comes out of the furnaces clean with no scale or oxidation."

Learn more about Hevi Duty vertical retort furnaces — write for your copy of bulletin HD-646 today.

HEVI DUTY®

HEVI DUTY ELECTRIC COMPANY
MILWAUKEE 1, WISCONSIN
Heat Treating Furnaces... Electric Exclusively
Dry Type Transformers *Constant Current Regulators*

NEW PRODUCTS and equipment

regulated by a scale showing 5-degree graduations.

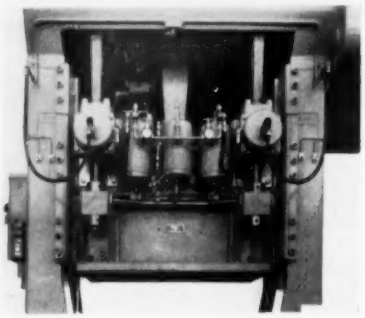
When positioned, each magnet can be locked in place, providing for positioning the tool to conform to almost every conceivable welding operation, and the holding of almost every shape or design of metal. Standard Portable Cord Co. Inc.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Adjustment Device

. . . detects double blank

A simple and compact hydropneumatic force adjustment device that acts as safety overload protection for the blankholder and pro-



vides a means for adjusting the blankholder pressure independently at all four corners has been developed by Federal Machine.

Unit makes it possible to determine the blankholder pressure required at each corner, and to duplicate this setting whenever the job is re-run without having to repeat the tedious blankholder setting required with the rigid blankholder. It also provides a positive safety overload protection in case of double blanks, as the device will detect the double blank and stop the press before damage to the press and dies occurs. Federal Machine and Welder Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Punch Press

. . . in midget size

A precision-built, midget punch press is offered for sale by Kenco Mfg. Following the general lines and specifications of their 4 and 5 ton presses, the 1½ ton press has: A solid crank shaft of alloyed

ENTHONE ENAMEL STRIPPERS

Custom Made

to fill your particular needs . . .

If you have trouble finding the right stripper to remove the coating on your work, Enthone will be glad to select the right one from the many they make or will formulate a new one that will meet your requirements.

All you have to do is fill out a questionnaire which will be sent you on request, send this to us with typical samples of your work. Enthone Research Chemists will make the necessary tests and tell you how your problems can be solved. There is no charge for this service.

Enthone Research Chemists have developed over a score of strippers for organic finishes and are constantly seeking better methods.

Write for Enthone check list on over sixty products and processes for better electroplating and metal finishing.

METAL FINISHING PROCESSES

ENTHONE
INCORPORATED
442 ELM STREET
NEW HAVEN, CONNECTICUT

ELECTROPLATING CHEMICALS

(Advertisement)

How to Save on STAMPINGS

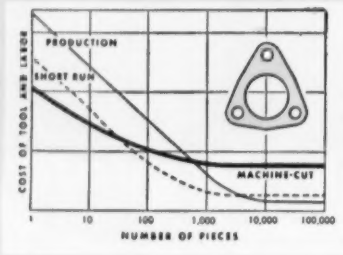
A COST-SAVING, VERSATILE APPROACH TO THEIR MANUFACTURE

Possibly you've always thought that a quick look at the quantity involved decides how a stamping shall be made. Sometimes it is done that way but it isn't the sure way to lowest costs.

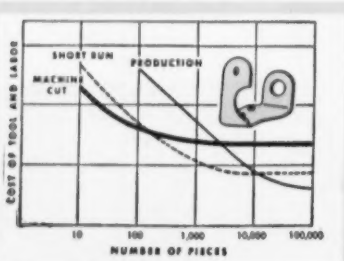
A more scientific approach by the STAMPINGS DIVISION of the Laminated Shim Company in Glenbrook, Connecticut frowns on the term "short run stamping." There is what is known as the short run *method* but there is no definite dividing point between short run and production quantities. Contour, tolerances, material, many other items all affect the manufacturing method when costs are being carefully figured.

NO ONE METHOD IS ALWAYS CHEAPEST; THREE ARE NEEDED

Machine-Cut Method: The STAMPINGS DIVISION goes one step further than Short Run and Production Methods. The Machine-Cut Method, though not strictly a stamping operation is a valuable addition to stamping procedure. Custom built slitters, cutters, saws and files use experience-gained techniques to fashion the smaller quantities of parts. No dies are made; only stock punches are used. Obviously labor cost is understandably high but there is no tool charge.



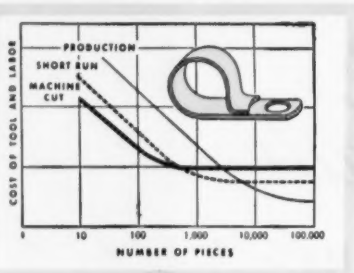
Short Run Method: As quantities increase (and depending upon the complications of contour, material, etc.) the economy of a temporary blanking die must be considered to eliminate the labor expense of machine-cutting. When this point is reached, manufacture is by the Short Run Method and the blanking is supplemented by other bench press operations. Here labor cost is at a medium level but a modest tool charge is incurred.



Production Method: As quantities increase the Production Method using standard dies with high speed automatic presses becomes more attractive. A relatively high tool charge can then be amortized over a great number of parts. Labor charge is negligible.

The Production Method as developed by the STAMPINGS DIVISION is offering unusual cost saving possibilities because of the new low-cost, full service Hecht-type die developed by the company for certain applications.

It is interesting to note that sometimes a very small quantity of parts would require a standard die because of complications or close tolerances or tough materials involved. Thus occasionally a very small quantity goes into the production classification.



LOWEST COST IS ASSURED WHEN SUPPLIER HAS ALL THREE METHODS

The illustrations show typical stamped parts along with relative costs and breaking points for each of the three manufacturing methods. Unless a supplier can offer all three, his costs cannot always be low. For a given quantity, only *one* method can be most economical.

ONE OR ONE MILLION PARTS FROM SAME SUPPLIER

An important corollary to the above is that an experimental part in small quantities can be handled by the same supplier when full production quantities are needed.

Further, it is important that a supplier be fully informed, if possible, on later or total requirements for a given part. As the charts point out, such information will affect manufacturing method and make possible cost reductions.

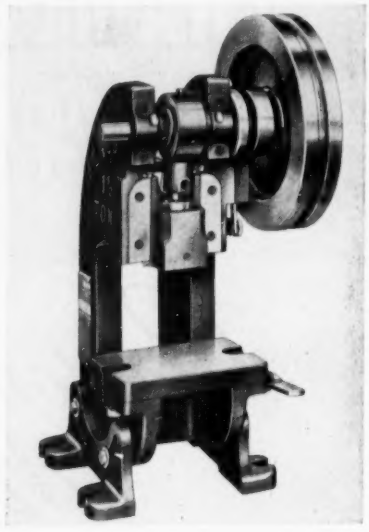
FURTHER INFORMATION AVAILABLE

An illustrated 12 page brochure describing in greater detail the methods mentioned above is available on request to the
STAMPINGS DIVISION
Laminated Shim Company, Inc.
3402 Union Street, Glenbrook, Conn.

NEW PRODUCTS and equipment

steel, heat-treated and precision ground; roller bearing-mounted flywheel; clutching mechanism self-contained and independent of the crankshaft.

The press is offered with ¾ inches as standard stroke, with 1



inch optional at extra charge. It is open-back and inclinable with all parts made extra-heavy for longer life and trouble-free operation. Kenco Mfg. Co.

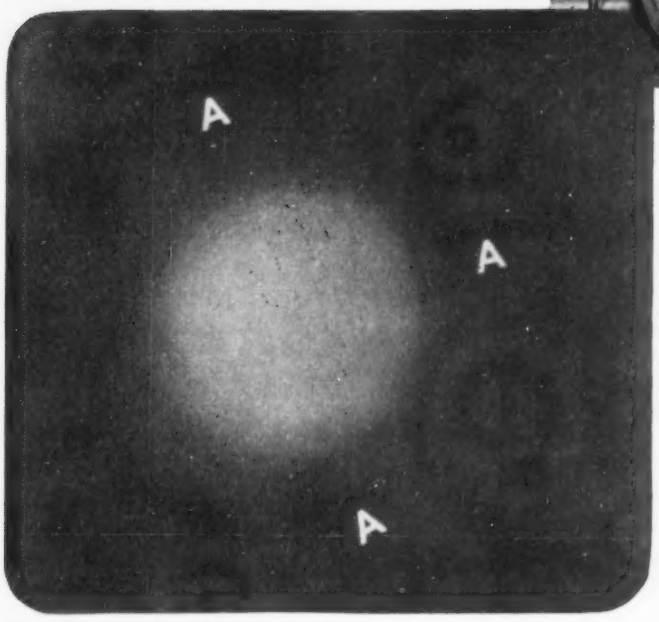
FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Grinding Gage

. . . scrap and rework eliminated

An electric grinding gage with many design improvements is being manufactured by Federal Products. The big money saving feature of the gage is the elimination of scrap and rework. Controlled by the dependable and accurate Electricator, every piece can be ground to proper size. It is made up of the Arnold grinding gage frame and caliper with the Electricator instead of the regular dial indicator, plus a power or control unit. With this gage the operator does not need to stop grinding to gage the work for size. Automatic control of the grinder begins as soon as the gage is snapped on the work.

Design improvements include the new splash-proof case which encloses both the indicator movement and the electric switching



Radiograph of repair weld

SAVED...

66⅔% in cost, 75% in time— because

RADIOGRAPHY proved welds sound

Cracks showed up in the shell of this stainless steel sphere. A new one would cost plenty—take priceless time.

But since radiography could prove welds sound and in conformance with code, stainless patches were welded in. The sphere went back to work in one fourth the time and at one third the cost of a new replacement. This is the way radiography helps extend the use of welding and widen opportunities for welders.

* * *

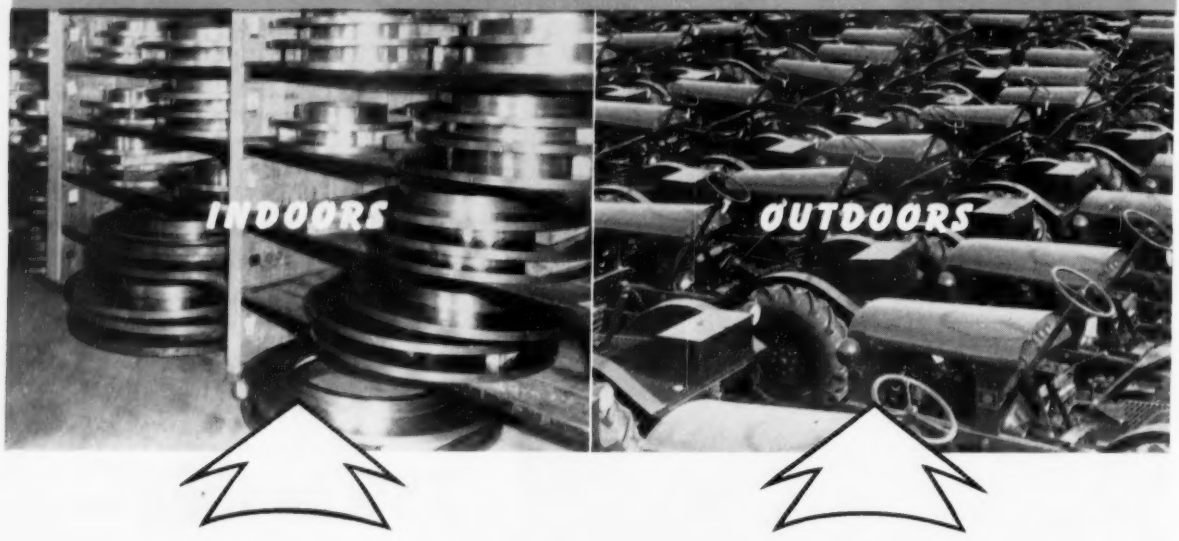
Wouldn't you like to know how it can help you increase your business? Get in touch with your x-ray dealer and talk it over.

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Radiography—
another important function of photography

Kodak
TRADE-MARK

HERE'S WHEN Twins SIMPLIFY PROBLEMS AND SAVE YOU MONEY!



use RUST VETO 377

. . . the modern thin-film polar-type preventive that is a "natural" for indoor protection.

Rust Veto 377 withstands severe humidity tests—passes rigid salt bath spray protection tests. It deposits a thin film which clings to parts through high polar attraction, but is easily removed. Resists oxidation. Won't stain. Sprayable at 40° F., it provides low cost coverage however applied.

use RUST VETO 344

. . . the rapid-drying, dark solvent solution that provides full protection for long periods outdoors.

Rust Veto 344 produces a dry, asphaltic type of film which can be handled after 4 hours drying. Can be used on steel, brass, aluminum or copper. Wipes off readily with solvent soaked cloth. Withstands 30 cycles in 100° humidity, ultraviolet light test. Won't harden or crack—it's rosin-free.

PREVENT RUST COSMOLINE RUST VETO

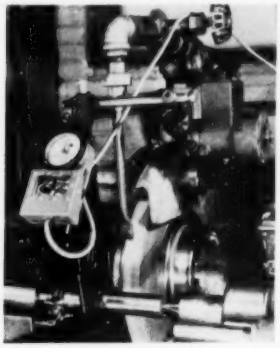
RUST VETO 377 & 344 *answers most rust preventive problems!*

WRITE FOR BULLETIN covering the wide range of Houghton "Rust Vetoes" for varying types of protection—for parts or products on shelves or in shipment, idle or in use. (To meet Government specifications, Houghton "Cosmolines" are widely used.) E. F. Houghton & Co., 303 W. Lehigh Ave., Phila. 33, Pa.

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

unit, providing positive protection from splashing coolants. A sep-



arate power unit eliminates the necessity for manually resetting the gage after each work cycle. Federal Products Corp.

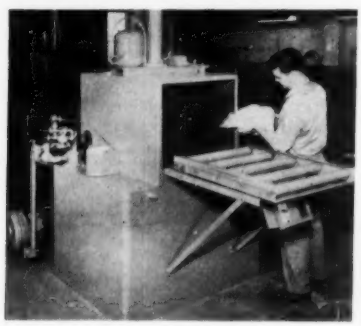
FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Washing Compound

. . . safe for metal surface

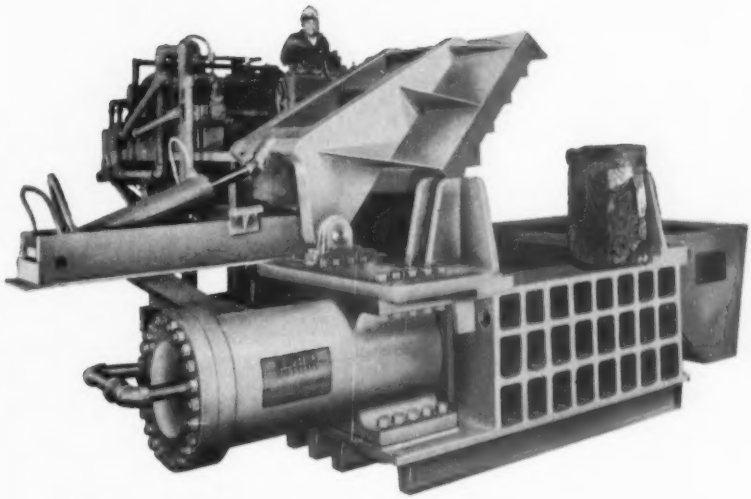
Washing compound 103 designed for effective removal of oil, grease, soils, lapping and drawing compounds is announced by Ipsen. Suitable for both batch and spray type washers, the degreasing agent will produce metallurgically clean workpieces within 3 to 10 minutes in circulating-type washing equipment.

Quickly penetrating oil and grease, surface action removes



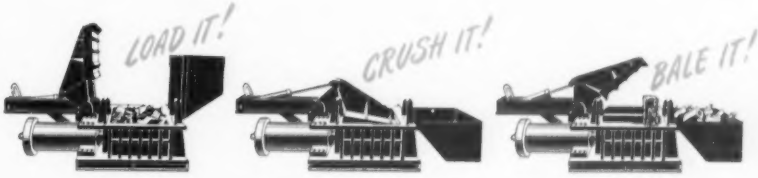
and floats away impurities. Parts dry bright and clean, without residue. Only mildly alkaline, it will remove heavy soils, such as drawing and buffing compounds; noncaustic, the compound is mild and will not harm skin or clothing; safe for metal surfaces, it will not corrode or etch finished metal parts. Ipsen Industries Inc.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17



Here's the nearest thing to Automatic Scrap Metal Baling!

WHEN YOU BUY a Dempster-Balester you not only get a press built to take the punishment of baling scrap metal consistently day-in and day-out . . . bale-after-bale, but you also get the nearest thing to automatic baling. The Dempster-Balester's LOAD IT, CRUSH IT, BALE IT cycle (illustrated below) is a simple 1-2-3 continuous operation.



1—Skip Pan LOADS charging box. 2—Skip Pan returns to loading position while Auxiliary Compression Door CRUSHES scrap. 3—As Compression Door returns to upright position, charging box door closes . . . scrap is BALED and ejected. As each cycle ends another begins.

Without question, Dempster-Balesters are the simplest, most efficient presses baling scrap metal today! And you have six to choose from—three standard and three high speed models that turn out high density bales in capacities to meet any requirement up to 10 tons per hour. Write to us for complete information. A product of Dempster Brothers, Inc.

Sold In Canada by W. P. Favorite Company of Canada, Ltd., 418 Main Street, E., Hamilton, Ontario

Mfg. In Canada by Hamilton Bridge Company, Ltd., Hamilton, Ontario

DEMPSTER BALESTER

DEMPSTER BROTHERS, 824 Shea Bldg., Knoxville 17, Tenn.

Lubrication . . .

CAN YOU SIMPLIFY YOUR SYSTEM?

Application of efficient methods to lubricant purchasing, storing and use isn't a natural. It take deliberate planning and some positive control

LUBRICATION MATERIALS and techniques, like most other branches of engineering, have advanced far in the last ten or fifteen years. New and improved lubricants improve the life and performance of almost any machine. Advantages, however, can't be realized until the lubricant has been properly applied —the right lubricant, uncontaminated, in the right place.

In many plants there are almost as many lubricants in use as there are machines, usually because the manufacturer of each machine has recommended a specific make of oil or grease.

Overlap—Here it is practically certain that properties of a large number of the different brand lubricants will be the same, giving rise to unnecessary purchasing and storekeeping costs, and involving considerable risk of contamination and mixing.

There is also a danger that among 20 or 30 lubricant grades available in the oil store or cabinet, an operator may use one that is grossly unsuitable for the application.

Where to Start—After the lubrication engineer has toured the plant and made his recommendations, each machine should be checked and all lubrication points enumerated. Defective nipples, lubricators, etc. should be replaced. Also you should perform any maintenance work that is indicated in the engineer's report.

Here is a hint: Whenever possible avoid Y or T-fittings which supply two points from a single oil cup. One branch of the line may choke and starve its bearing, all the lubricant going to the other.

Automatic—When a machine is provided with a large number of individual lubrication points it is often advisable to install an automatic or one-shot system. Such a system can pay for itself in a few months by time and labor saving in lubrication, reduced risk of the overlooked lubrication point, and by lubrication application during the machine or equipment cycle.

Independent—Other shops go to the opposite extreme, using one or two arbitrarily selected lubricants for all applications and ignoring completely any manufacturer's or other recommendations.

First step in alleviation of this problem and the rationalization of lubricant stocks is to call on the services of a lubrication engineer. He will submit a recommendation list showing the lubricants suggested for each machine in the plant. As a general rule, three to five oils and two or three greases will satisfy 98 per cent of the requirements of the average plant. Generally, there is no charge for this service.

Economies — Direct savings through this rationalization of lubricant stocks result from lower inventory and purchasing costs.

By PAUL D. HOBSON
Beloit, Wis.

Another factor not to be neglected is that indirect savings through this rationalization of lubricant stocks result from lower downtime and maintenance costs.

Leeway—An occasional difficulty is that a machine manufacturer will specify a particular branded lubricant as a condition of his guarantee. In such cases a letter to the manufacturer, specifying the lubricant that is proposed as a substitute, will generally bring a favorable reply permitting the substitution without voiding the guarantee.

When permission is refused it is often possible to obtain a guarantee from the oil company covering the machine against damage arising out of lubrication failure when the company's product is used.

Excess—Too much grease forced into a bearing can cause it to overheat and fail, too much oil may cause splashing and consequent spoilage of work and inconvenience to employees. Too little of either will produce wear and possible seizure.

In pressure lubricated machines with a circulating oil system, too little oil will generally give rise to high oil temperatures and rapid deterioration of the lubricant, too much to wastage and mess as the excess is forced out of the vents as liquid or vapor.

Weight—Too heavy an oil or grease will cause loss of power and may give rise to overheating. Too light a lubricant may break down under the operating temperatures or pressures encountered. Thus, lubricant storage and handling systems should be set up to preclude the application of the right oil to the wrong job.

On the Spot — Lubricant also must be properly placed. It is not at all uncommon to find that a grease nipple or oil cup is placed in an inconspicuous position on a machine and overlooked until failure has occurred. This is particularly frequent when all other points are lubricated by means of a pressure circulating or other automatic system. Sometimes an operator responsible for the lubrication of his own machine fails to carry out this duty due to lack of instruction or of mechanical sense.

Such cases range from that of a girl who carefully filled the sockets of the capscrews on her machine with oil and put none in the oil cups because "It's a waste of oil, it all runs out again after a few minutes" to the man whose machine broke down every Monday morning because he thought the maintenance crew was keeping it oiled and they thought he was.

Timing — Lubrication must be carried out before the oil or grease in an individually lubricated bearing is exhausted, and before the oil in a continuous circulation system has deteriorated to the point where it is no longer an effective lubricant. On the other hand, too frequent lubrication or renewal of oil is obviously wasteful and may give rise to the troubles associated with over lubrication.

Both extremes, the practice of waiting until a machine slows down or heats up before lubricating, and that of swamping the bearings with oil or forcing grease into them every few minutes, are encountered with distressing frequency.

Personnel—To be effective, a lubrication program must be carried out by intelligent and conscientious men with enough mechanical knowledge to understand what they are doing.

The oiler need not necessarily be a trained mechanic, but, if the proper type of man is employed, one of the indirect dividends is that incipient mechanical trouble, often having no direct connection with lubrication, is detected by the oiler during his regular inspection of each machine.

Program — Lubrication program should be drawn up to insure, as far as possible, that all machines are inspected at least once each working day, preferably once a shift, and lubricated as often as may be necessary.

The automatic lubrication system type requires only that its oil or grease reservoir be regularly replenished. The one-shot lubricator delivers a shot of lubricant to each bearing whenever a lever is pulled or a button pressed.

Incompatible—A marking system on oil drums, cans, grease guns and other equipment will reduce the possibility of the wrong lubricant being used on any bearing. Don't mix these lubricants without checking for manufacturers' recommendations.

Also, be careful to use only those additives which are recommended by competent authority as being compatible with the basic lubricant being used.

Paperwork—A positive step to proper lubrication schedules is the preparation and use of a lubrication diagram for each type machine, a chart on each machine which shows the dates on which the machine received lubrication, and a route sheet which indicates to the oiler the machines and departments for which he is responsible. This sheet should also indicate the lubrication schedule.

CHECKPOINTS FOR YOUR LUBRICATION SYSTEM

AFTER analyzing your lubricating needs, set up a routine schedule and outline for the oiler to follow. Be sure he is properly instructed on all oil and grease points and their requirements.

A small amount of time spent on training will save dollars when the system is in operation.

KEEP the lubricant and lubrication system clean—even the best lubricants won't work properly if contaminated. Keep cans and drums covered.

AVOID under and over-lubrication. Actually, the latter causes trouble more often.

CONSULT your supplier before you put additives in your lubricant. Avoid mixing of lubricants without consulting manufacturer. Above all never top up a system containing used oil of one grade with fresh oil of a different make or grade.

Adhesive Application

Rubber bulb method can be used in confined areas, minimizes dripping, spillage

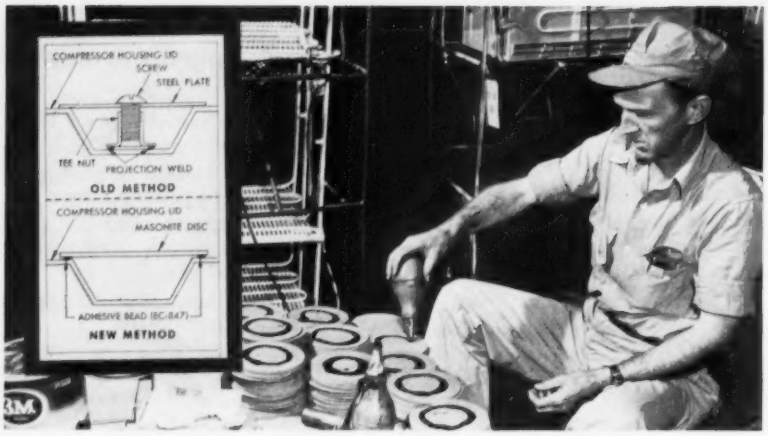
ENGINEERS of Crosley Div., Avco Mfg. Corp., Richmond, Ind., sought a fast, inexpensive, yet foolproof method of application of adhesives used in refrigerator assembly.

They solved their problem by using a small rubber bulb fitted with the proper size nozzle. This method can be used in a confined area, keeps dripping and spillage to a minimum and lays down a comparatively uniform bead.

This new type of flow gun can be handled with one hand, requiring only a slight pressure to operate. It eliminates fatigue and permits a high production rate. Filling is simple and quick, and a large number of parts can be coated with one filling.

Glass Bonded—In one of the operations, 3M adhesive EC-871 is used for bonding fibrous glass insulation strips to a one-piece plastic trim frame adding beauty to the refrigerator and at the same time improving its insulating qualities. The glass strip is pressed into contact with the adhesive within a few seconds. A two-man team can produce 1200 insulation trim frames in 8 hours.

Another adhesive, 3M's EC-847, is used in bonding Masonite discs to the compressor housing lid. Steel shot is placed in a recess in the compressor lid to act as a vibration and sound dampener. The adhesive coated Masonite disc is pressed on, as the assemblies pass the operator on a moving conveyor. One man can produce about 1000 pieces per eight-hour shift and perform one other operation on the same number of pieces.



MASONITE DISC BONDED TO COMPRESSOR HOUSING
. . . production speeded, tee nut and screw eliminated

Never too hot, never too heavy,

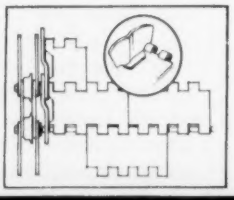
MAY-FRAN

Here's a conveyor belt built to take it . . . to last as long as the machinery it serves! Once installed, it's in to stay. MAY-FRAN engineers poured abrasive carborundum dust continuously on operating belt for a prolonged period of time . . . and it came through this grueling test still intact and serviceable!

You may not want to transport carborundum dust — but if you have foundry castings . . . die castings . . . hot forged

1748-MF

Outside links incorporate interlocking wings . . . remain positively engaged at all times. New interlocking flanges permit staggering of links . . . eliminate lateral movement.



MAY-FRAN

Plastic Joggle Dies

Originally intended for whole die, but too pliable, Dunnlew is used for facing with success

A NEW plastic, brainchild of a pair of Boeing Airplane Co. engineers, Seattle, Wash., was designed for a specific use in B-52 production, but couldn't quite live up to requirements. A veteran diemaker who had helped to test the new material, suggested that the plastic had properties which might fit it for use in making jogging tools, also for the B-52.

Joggles, used extensively in the modern airplane, are small step-like offsets formed in metal. Until recently, each die and punch used to form them was made of steel, laboriously finished by hand. With the plastic, Dunnlew, as a facing for their working surfaces, finishing time is cut to a fraction.

Facing—After a trial run disclosed too much give in dies of solid plastic, it was decided to rough the tools out of steel and use the plastic as a facing. This modification proved completely satisfactory. Finishing time on the dies calls for the greatest amount of handwork in the whole process of making these new-type dies, and that is cut down to a fraction of the time necessary to finishing the all-steel dies. One die maker finished a plastic tool in 35 hours. It would have taken him approximately 100 hours to complete one all-steel tool.

JOGGLE-FORMED PLASTIC DIES
. . . save finishing time

Pipe Fitting Standards Revised

One of the most widely-used American Standards, steel pipe flanges and flanged fittings (B16.5), has just been revised and supplemented because of new materials recently developed in this field. The new edition provides for fifteen different types of steel. It covers nominal pressures of 150, 300, 400, 600, 900, 1500 and 2500 psi, and includes references to valves.

New standards provide a method for rating materials so recorded that it will be possible to give all new materials developed in the future the proper pressure-temperature ratings, solving many of industry's headaches before they occur.

Other new data are the designation of drain locations on valves and specifications for threaded, socket-welded, and butt-welded drain connections, and for the diameter of bosses for drains. Edition is available through association headquarters, 70 E. 45th St., New York 17. Price is $3.

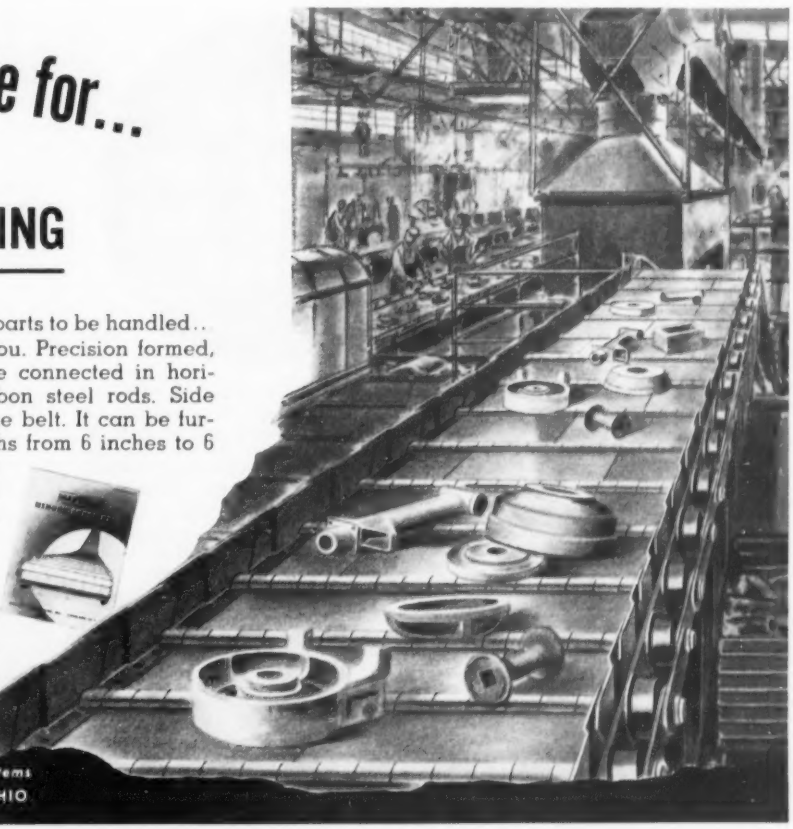
never too abrasive for...

HINGED-STEEL BELTING

items...hot, heavy or abrasive metal parts to be handled.. MAY-FRAN hinged-steel belt is for you. Precision formed, heavy-gauge hinged-steel links are connected in horizontal rows by means of high-carbon steel rods. Side chains become an integral part of the belt. It can be furnished to your specifications in widths from 6 inches to 6 feet and in any length or carrying capacity. Both solid and perforated links are available in 2½ to 12-inch pitch lengths.

If you want conveyor belting that can withstand the roughest usage, specify MAY-FRAN hinged-steel belt!

Write today for complete information



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Designers and Builders of Complete Handling Systems
1725 CLARKSTONE ROAD · CLEVELAND 12, OHIO

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BLOWERS • GAS PUMPS • VACUUM PUMPS
And whether you need a breath or a bellow, Sutorbilt can provide the air to fit your particular demands.
Blowers and Gas Pumps include—
Heavy duty Anti-Friction Bearings (Throughout),
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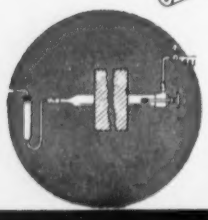


McDanel Porcelain Combustion Tubes and Zirco Tubes are precision made. Density, bore size, wall thickness, etc. are carefully controlled to assure maximum resistance to thermal shock, accurate fit and gas tightness. Cast as a single unit, they defy devitrification—give longer service and lower replacement costs. For carbon and sulphur determinations, McDanel Tubes are *tops*.

Leading metallurgists in the steel and iron industries say: "McDanel Tubes stand up well under extremes in temperature"—"Never spall or blister"—"Highly satisfactory in every respect".

Specify McDanel High Temperature Porcelain Combustion Tubes and Zirco Tubes from your supplier.

OTHER McDANEL PRODUCTS

- Non-spalling, non-blistering, gas tight Combustion Tubes.
- High Temperature Zirco Tubes.
- Self Cooling Combustion Tubes.
- Refractory Porcelain Specialties in stock or designed to meet your needs.

McDANEL
Refractory Porcelain Co.
Beaver Falls Penna.

Heliarc Weld Economies

Provides high-quality welds and substantially reduces production time requirements

HELIARC WELDING, being used for the first time by Linde Air Products Co., Union Carbide & Carbon Corp., New York, in manufacturing evaporator units for refrigerators, offers two distinct advantages, according to the company.

Linde says it provides the high-quality welds needed; it substantially reduces production time requirements.

For welding a back plate to the drawer-shaped unit, two units

HELIARC TORCH WELDS ONE UNIT
. . . half-turn sets second

of 3/32 inch deep drawn 1010 steel are clamped in a rotating jig, one upright, the other upside down. In the fabricating process every evaporator unit requires seven skip-welds, each ¾ inch long.

Round She Goes — When the welds are completed on one evaporator, a twirl of the jig brings the second unit in position for welding with no loss of time. Each skip-weld takes ten seconds, and in less than 2½ minutes two units with a total of 14 welds are completed.

These spatter-free welds require no mechanical finishing, and upon completion, all units need only to be degreased, zinc plated, and they are ready for immediate installation.

For fine quality and fast delivery specify Jessop corrosion and heat-resisting steels

Jessop lays no claim to being the only good source of fine stainless steels. *There are a number of very reputable concerns producing products of excellent quality.* But we believe we possess a combination of virtues which make it highly worthwhile to specify Jessop when ordering stainless bars, sheets, plates or *rolled angles* —a recent addition to our line.

First of all, our stainless unit is moderate in size, yet all operations through melting, rolling and processing are carried out by us at one location. This affords an opportunity to offer the same individual attention and fast delivery on any order, large or small. Second, we'll take a back seat to no one when it comes to quality control and finish. It's a matter of pride with us. And last, but not least, you'll be dealing with a young, aggressive organization which understands that *the best way to keep growing in these days of tighter competition is to build repeat orders through satisfied customers.* Send us an inquiry.

JESSOP

STEEL COMPANY · WASHINGTON, PENNSYLVANIA

By the use of high electrical voltage Metalmaster has given its user the power and speed to cut the hardest metals man has been able to produce . . . This we call DISINTEGRATION for it actually disintegrates the metal without affecting the hardness.

Metalmaster Disintegrators save thousands of dollars each month for their users through the salvage of workpieces normally going into scrap.

One firm alone through the use of two Metalmasters saves annually over $70,000.00 in just tool and die repair alone.

IMAGINE, for a moment, the potential . . . if you could cut ANY shape hole, ANY size in ANY hardened metal!

IMAGINE, for a moment, the potential . . . if you could cut a CURVED HOLE IN METAL!

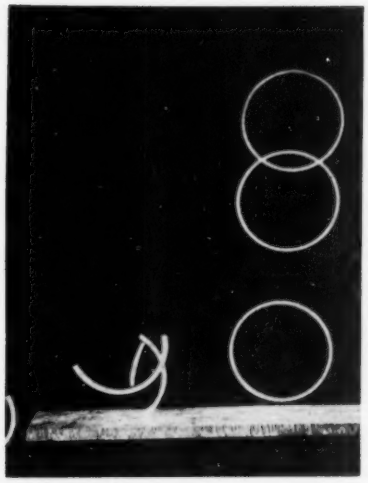
IMAGINE, for a moment, the potential . . . if you could save that enormous scrap pile of workpieces with broken taps, drills, reamers, etc. You can do it with Metalmaster . . . in a matter of minutes per part.

IMAGINE, for a moment, the potential . . . of a machine that in many cases saves its initial cost in just one free demonstration in a customer's plant. This is a common occurrence with Metalmaster.

For information relative to the many machines available for your type operation and the many advantages Metalmaster can offer your firm, write today on your company letterhead to:

METALMASTER DIVISION:
CLINTON MACHINE COMPANY
CLINTON, MICHIGAN

Remove Broken Taps fast without distortion
Cut oil holes in hardened gears without annealing
Cut dovetails in hardened dies
Cut any shape hole in cemented carbides



Ductile Iron: More Bounce

When dropped from a height of 20 feet, this new cast iron, developed by International Nickel Co. Inc., bounces, where ordinary gray iron section breaks. Not brittle, it cannot be bent or twisted. It is finding broad application in all fields of industry

Alarm for Separators

A completely automatic alarm system, called Magnalarm, operates automatically to remove the cause of product contamination, machinery damage and fire and explosion.

The causes—tramp iron and ferrous particles on the magnetic separators—are measured as they accumulate on the surface. This reacts on a circuit to trip an alarm as soon as a predetermined accumulation is reached. Factor of human error is thereby eliminated from the procedure of periodically cleaning accumulations from the magnet's face.

Saves Maintenance — By automatically alerting maintenance men when the magnetic separators need cleaning, Magnalarm insures that the vital magnetic controls will always be working at optimum efficiency. Unless the alarm sounds, the operator knows that no inspection is required and that production can continue without interruption.

Eriez Mfg. Co., Erie, Pa., points out that magnetic separators derive their powerful magnetic force from castings of Alnico V metal, the magnetic strength of which is guaranteed for the life of the equipment in which it is installed.

Carbon Bonded Pouring Spouts

Pouring spouts, developed for a new western copper refinery, are helping to maintain continuous 24-hour-per-day production of horizontal cast copper wire bars. The carbon-bonded silicon carbide spouts last from three to four days of continuous service during which time little repair work is required. Electro Refractories & Abrasives Corp., Buffalo, New York, has made these spouts from a carbon-bonded silicon carbide.

Spouts resist the wetting action of the cuprous oxide present in molten tough pitch copper, preventing metal or slag penetration and resultant destruction of the refractory.

Furthermore, the pouring spouts maintain their desired size so that four individual streams of molten copper may be delivered into individual molds at a definite and uniform rate of flow. No external heat is required to maintain the temperature of the ladle spouts between pours.

You're sure of
UNIFORM HIGH QUALITY
SEAMLESS • PRESSURE • MECHANICAL
CARBON STEEL TUBES
when you specify GLOBE

SIZE RANGE — WALL THICKNESS

Globe seamless carbon steel tubes are available in a size range of ½ inch to 7½ inches O.D.; wall thickness of .028 to 1.000 inch.

APPLICATIONS

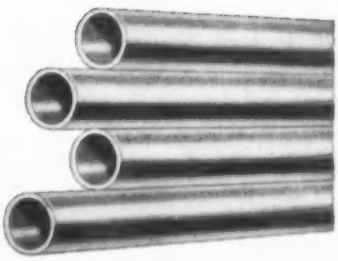
Globe Pressure Tubes are used for boilers, condensers, heat exchangers and process equipment. They meet most exacting demands of modern high pressure and high temperature installations.

Globe Mechanical Tubing (seamless) is produced by piercing solid billets. It is an ideal material for load-bearing structural members and parts where strength with minimum weight is needed. Its economy for the manufacturing of many machine parts is universally recognized.

Globe seamless carbon steel tubes are furnished to standard specifications in low and medium carbon ranges.

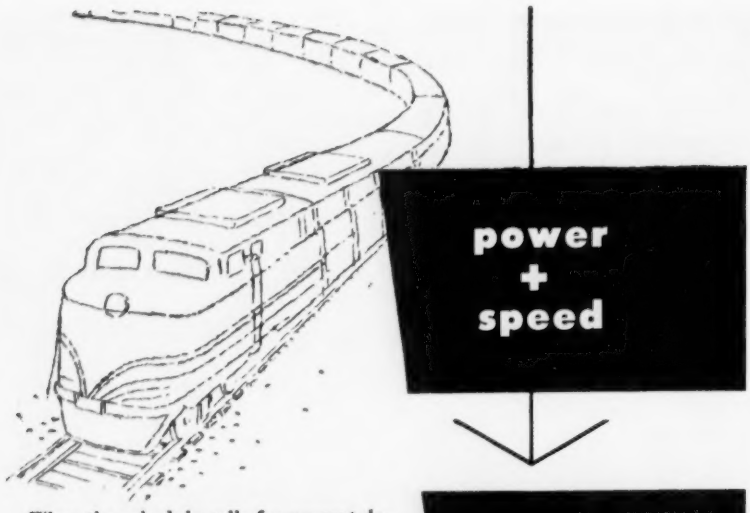
When you specify Globe you are sure of uniform high quality carbon steel tubes. That's because they are the product of highly developed production facilities and specialized quality controls and methods.

Globe engineers are at your service to assist in the selection of tubing of the exact characteristics you require.

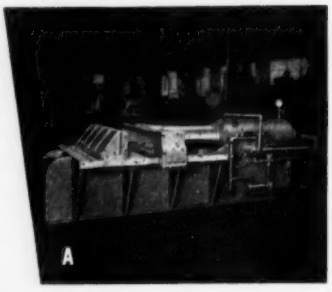


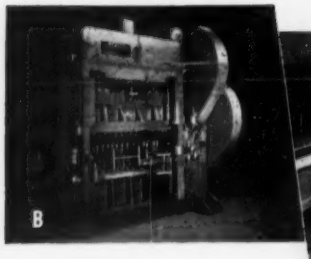
GLOBE
STEEL TUBES CO.
MILWAUKEE 46, WISCONSIN
Chicago • Cleveland • Philadelphia • St. Louis
New York • Detroit • Denver • Houston • San Francisco • Glendale, Calif.

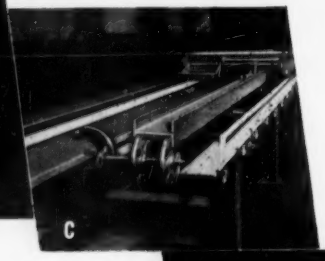
Producers of Globe seamless stainless steel — Gloweld welded stainless steel tubes — alloy-carbon seamless steel tubes — Globeiron (high purity ingot-iron) seamless tubes — Globe precision-process welding fittings.

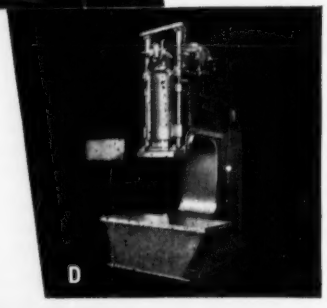


When the schedule calls for prompt delivery of goods, the diesel engineer can "pour on the oil" for reserve power. BEATTY metal fabricating machines have this same type of built-in power reserve for industrial production purposes. One of the machines illustrated can be modified to fit your particular needs. Or, if you prefer, call in our engineers to design and build a machine to your exact requirements.

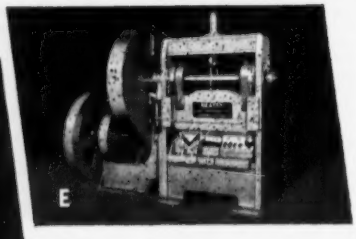




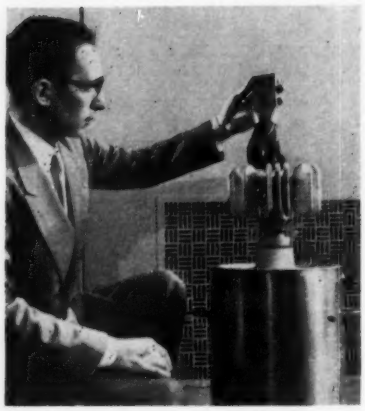




A. BEATTY Horizontal Hydraulic Bull dozer for heavy forming, flanging and bending.
B. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.
C. BEATTY Spacing Table handles web and flange punching without roll adjustment.
D. BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.
E. BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.



BEATTY
MACHINE & MFG. CO.
HAMMOND, INDIANA



More Powerful Ignitrons

Westinghouse Electric Corp.'s sealed ignitron mercury-arc rectifier is capable of rectifying 1000 kw at 250 volts direct current or 1500 kw at 600 volts using six tubes, each only 12 in. in diameter. Welds can be cut, tube repaired, rewelded, to be good as new

Line Losses Measured

Two companies, General Electric Co. and American Gas & Electric Service Corp., co-operated in the development of a device known as a transmission penalty factor computor (TPF).

The device will aid in determining the most economical means of generating and transmitting the extra power needed to make your breakfast toast and coffee, turn the wheels of industry while you work, or light your home during a daytime thunderstorm. To do this, TPF uses a comparatively new mathematical formula built into a maze of dials.

Big Saver—Estimated to save costs in the amount of $100,000 a year, the first TPF will be installed in the production co-ordination office of AC&E at Columbus, O., in about nine months. It will be equipped with 1290 dials set to express the power system mathematically including number of stations, inter-connections with other systems, the amount of electricity being generated at different plants, and the distribution of users.

The TPF will be used in conjunction with an existing device that determines maximum economy from the standpoint of fuel costs. It automatically relates this factor to transmission line loss to provide a combined answer.

For copper in any form –
For top-notch service –
Call Chase

What kind of copper or copper alloy do you need? Free-cutting brass rod? Sheet and strip brass? Phosphor bronze for springs? Call your nearby Chase warehouse. We can supply you with the widest variety of brass or copper materials for production, maintenance or repair.

Many of our branches are equipped to slit, saw, or shear our metals or your own stocks to specifications.

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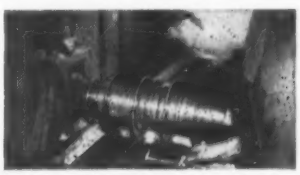
• *The Nation's Headquarters for Brass & Copper*

Albany†	Cincinnati	Houston	Minneapolis	Pittsburgh	Seattle
Atlanta	Cleveland	Indianapolis	Newark	Providence	Waterbury
Baltimore	Dallas	Kansas City, Mo	New Orleans	Rochester†	
Boston	Denver†	Los Angeles	New York	St. Louis	(†sales office only)
Chicago	Detroit	Milwaukee	Philadelphia	San Francisco	

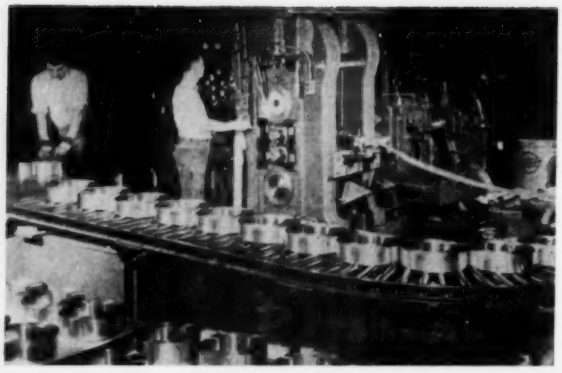
Deliveries to your factory by truck, rail or express, if desired.



Close tolerance sawing, slitting, shearing to your specifications.

Stocks of tube, rod, bar, strip, sheet and wire in a variety of alloys.

Coils of copper water tube get final inspection as they leave annealing furnace at Chase Brass & Copper



Beryllium-copper strip here contains only 1 per cent of former. It combines high strength, conductivity

Production of socket head screws from silicon bronze wire takes these six steps at Bridgeport Brass Co.

(Continued from p. 132)

formation or both. Most are capable of quite severe cold-working; and result is that mechanical properties, including tensile strength, hardness and ductility, can be altered drastically.

In sheet and strip, reductions in thickness by cold-rolling for temper control may vary anywhere up to about 60 per cent or more; and in wire, cold reductions by drawing may reach as high as 95 per cent. While temper reductions have commonly been referred to by such terms as quarter hard, half hard, hard, or spring, there is an increasing tendency to state them directly in terms of percentage of cold reduction.

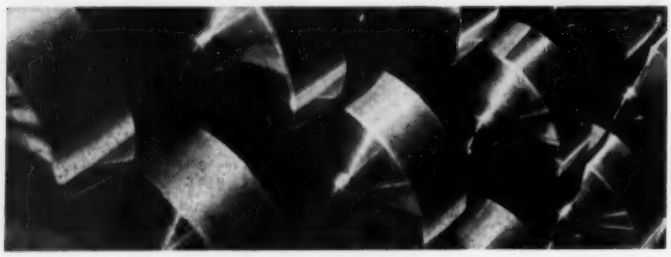
The alloys mostly used for rod do not lend themselves to the severe reductions frequently given wire. The two tempers most commonly used are half hard and hard, corresponding roughly to 10 per cent and 25 per cent reductions by drawing.

For tube, there is little need for a great variety of drawn tempers. The one most used is drawn general purpose temper, indicating merely a final cold reduction rather than an anneal; but here the degree of reduction is quite unimportant. Hard temper, meaning a draw in the range of 35 per cent to 50 per cent, is fairly common and there is less frequent need for light drawn temper, resulting from a reduction of about 10 per cent.

Grain Size—With copper and the all-alpha, solid solution alloys, varying degrees of final anneal are invariably stated in terms of the average grain size. The softness and capacity for further cold-working increase more or less directly with the average grain size in the range from about 0.015 to about 0.100 mm.

There is much interest in the adaptation of mill procedures to the development of extremely fine-grained but fully recrystallized metal for smooth surface and comparatively high strength in certain cold-formed products. The grain sizes are about 0.005 mm or even less.

Since in alpha-beta alloys, grain size is not an adequate indication of degree of annealed temper, the terms light annealed and soft annealed are used. They indicate conditions roughly equivalent to 0.025-mm and 0.070-mm grain size (respectively) in all-alpha brasses.



These brass rotors are used in submarine gyro compasses. Copper is used in many marine instruments

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. . . and ILLINITE Saws, Milling Cutters, Power Blades, Shaper Cutters, Hobs and Tool Bits.

ILLINITE End Mills are made by Illinois Tool Works, recognized for over forty years as manufacturers of the world's finest cutting tools. Always specify ILLINITE End Mills, and be certain of *uniform* high quality and precise standards of accuracy. Advanced metallurgy assures you of maximum cutting life in every ILLINITE Tool.

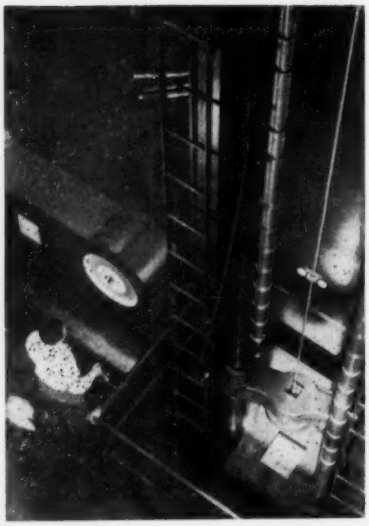
Your local distributor will make prompt deliveries of ILLINITE Standard Cutting Tools, from stock. Depend on him—and on ILLINITE Tools—to meet your cutting tool requirements.

Gloves Cut Costs

Use of loop pile fabric gloves reduces cuts and other injuries requiring first aid treatment by 70 per cent.

That's the report of John J. Nesbitt Inc., Philadelphia, who process tons of sheet steel each week in the manufacture of heating, ventilating and air conditioning products. Workmen handle the sharp-edged sheets many times in the various fabricating and assembly operations, multiplying the chances of cuts and bruises and when the sheets are oily, increasing the hazards of other injuries caused by pieces of metal slipping or falling.

Plant-wide Use—To reduce the number of injuries, Nesbitt uses the gloves, supplied by C. Walker Jones Co., Philadelphia, in virtually every department of the plant where metal sheet or fabricated parts are handled. The gloves, interchangeable right for left, are able to resist wear and cutting. They can be washed repeatedly and Nesbitt finds that by furnishing gloves free to workmen, the plant safety engineer can make sure that the best type of glove for the job is used. Furthermore, employees are more likely to turn in gloves for new ones before they become so worn as to be unsafe.



Tensile Aluminum Tester

A section of steel core reinforced aluminum cable used in overhead line transmission systems, is undergoing tests in the laboratories of Anaconda Wire & Cable Co. The cable will be stretched to the breaking point and stress-strain data recorded

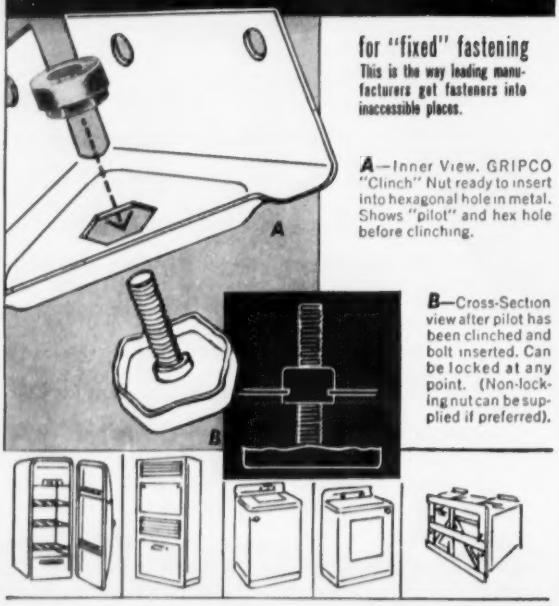
Isotopes for Industry

Radioactive isotopes are being relied on more and more to solve research and production problems. The Armour Research Foundation of Illinois Institute of Technology reports that it used more than 100 times as much radioactivity in 1953 as it did in 1951. The Foundation, which conducts research and development services for business and industry, says that rapid strides have been made in making the material available for research and production use, as well as for medical purposes.

Radioisotopes are used by the nuclear physics section at the foundation to help solve problems in ore separation, muscle composition analysis, wear studies of turbine blades, direct generation of electrical energy, soil permeability studies, and automatic machine control.

how appliance manufacturers use

GRIPCO "CLINCH" NUTS IN "BLIND" ASSEMBLIES



for "fixed" fastening

This is the way leading manufacturers get fasteners into inaccessible places.

A—Inner View. GRIPCO "Clinch" Nut ready to insert into hexagonal hole in metal. Shows "pilot" and hex hole before clinching.

B—Cross-Section view after pilot has been clinched and bolt inserted. Can be locked at any point. (Non-locking nut can be supplied if preferred).

● Makers of washers . . . dryers . . . refrigerators . . . ranges . . . freezers . . . room air conditioners and many other appliances are enthusiastic over these new and better fasteners—Gripco "Clinch" Nuts. In many cases they do a double job—*first*, to hold the product rigid and safe in its container during shipment, with no risk of bolts "backing out"—and *second*, for holding the adjustable "levelers" after the appliance is delivered to the user. If you have any application with hard-to-get-at fastening or that needs additional threading depth for applying bolts to thin metals, investigate Gripco "Clinch" Nuts.

Where Welding is Available—You may prefer to use GRIPCO Pilot Projection Weld Nuts

Circular pilot accurately positions nut in the bolt hole, for resistance welding. No jigs necessary. Two pilot heights for different gages of metal.

or GRIPCO Countersink Weld Nuts

The special countersink feature eliminates the possibility of hot metal particles lodging in the threads; thus no retapping is necessary.

6-Point Security Fastener Against Failure

GRIPCO LOCK NUTS

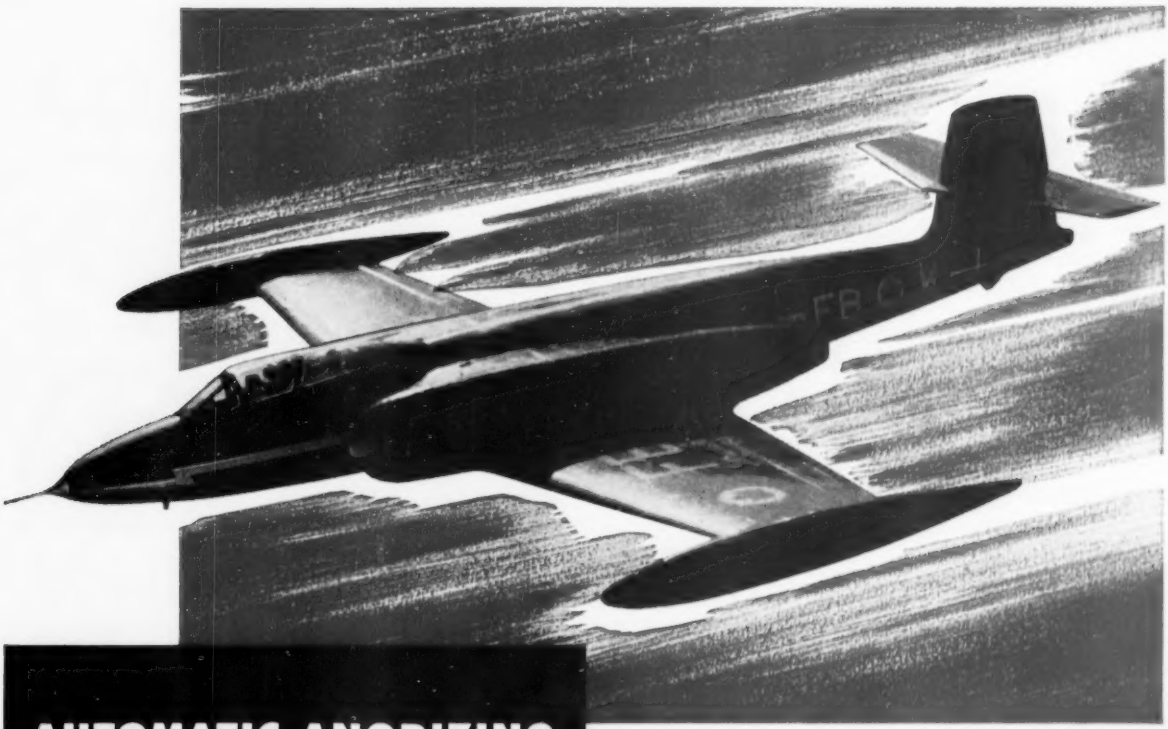
1—Firmly lock on to bolt at any position.
2—"Stay put" on bolt, in spite of vibration, tension, etc.
3—Positive locking action not due to any outside devices, but result of simple vertical thread deflection.
4—Oil or water do not affect Gripco locking action.
5—Can be removed with a wrench and reapplied repeatedly without loss of locking action.
6—Cost less because of simple design.

LET GRIP NUT HELP SOLVE YOUR FASTENING PROBLEMS

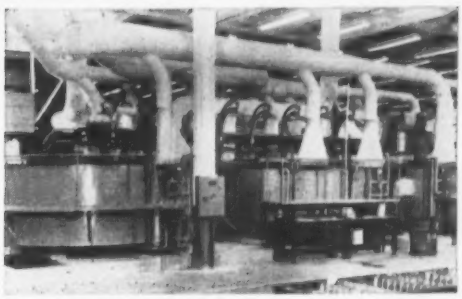
Write for samples, mentioning types and sizes of nuts you use. 460-S

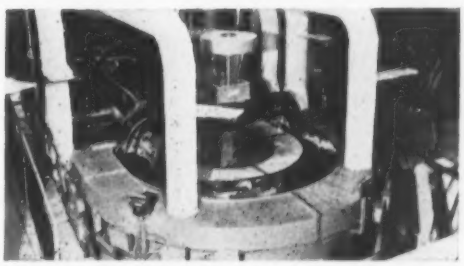
GRIPCO GRIP NUT COMPANY

308-N S. Michigan Ave., Chicago 4, Ill.



AUTOMATIC ANODIZING CHROMATING DULITE PROCESSING . . .





EXCEEDS THE EXACTING REQUIREMENTS OF CANADA'S "ORENDA" JET!

The A. V. Roe Company, Ltd., manufactures the famous ORENDA jet engine for the AVRO CF-100 all-weather fighter. They must meet very exacting metal finish processing requirements.

That's why A. V. Roe selected Frederic B. Stevens of Canada, Ltd., to outfit their Malton, Ontario, Jet Engine Plant with Stevens Automatic Plating and Processing Equipment.

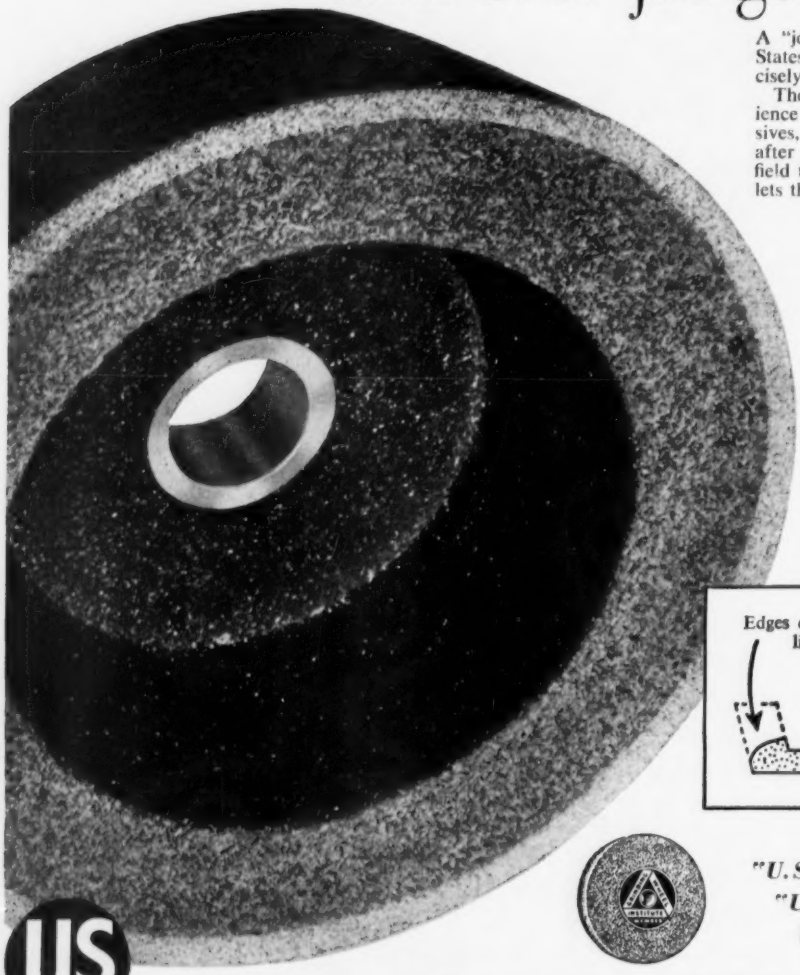
Stevens automatic anodizing, chromating and blackening machines assure metal finish processing that will meet critical specifications while performing as a routine production operation.

If you have a problem involving plating, bright dipping, cleaning and pickling or any other metal finishing process, see your nearest Stevens sales engineer or write direct.

FREDERIC B.
STEVENS
INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

BRANCHES: BUFFALO • CLEVELAND • INDIANAPOLIS • NEW HAVEN • DAYTON
IN CANADA: FREDERIC B. STEVENS OF CANADA, LTD., TORONTO • WINDSOR

Increased output per worker... with U.S. "job-geared" wheels

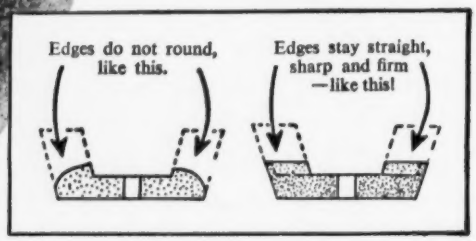


A "job-geared" wheel is one which United States Rubber Company engineers have precisely designed to handle the particular job.

These experts, backed by 90 years' experience in resinoid or rubber bonds and abrasives, select or develop such a wheel only after close study of job requirements, plus field tests. The result to you is a wheel that lets the worker do a better job in less time—at less cost to you. The resinoid U.S. Royalite® Cup Wheel shown above, for example, is finishing the steel table top for a large industrial saw. This wheel has been given just the right compounding to finish the already semi-smooth surface. It's a "job-geared" wheel.

The wheel at the left is a resinoid U.S. Royalite Hard Shell Cup Wheel for edge grinding. Its free cutting core has a tougher rim, which keeps the edge sharp for the full life of the wheel.

Remember that the "U.S." sales engineer is a specialist in abrasives. Next time he's in your plant, consult him on any grindings problem. It pays off. Write to address below.



"U.S." Research perfects it
"U.S." Production builds it
U.S. Industry depends on it

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Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

STEEL

February 8, 1954

Market Outlook

STEEL demand in the next two months will be about the same as it is today.

You can come to that conclusion by looking at the projected production schedules of the automobile industry, the largest single consumer of steel. It is not increasing its February and March schedules over the January pace. The auto industry can be considered a representative gage of steel demand, for it uses one-fifth of all the steel produced in this country.

BLUEPRINT—The U. S. auto industry's aim for this quarter is production of 1,497,300 passenger automobiles. It turned out 459,000 in January and expects to make 479,000 in February and 559,000 in March. While that March figure is higher than those for January and February, the daily rate of outturn is about the same for all three months. March has 23 working days. January and February each have 20 this year. On the basis of these figures, the daily rate of output in January was 23,000 passenger autos and the daily rates for February and March will be 24,000 and 24,300, respectively.

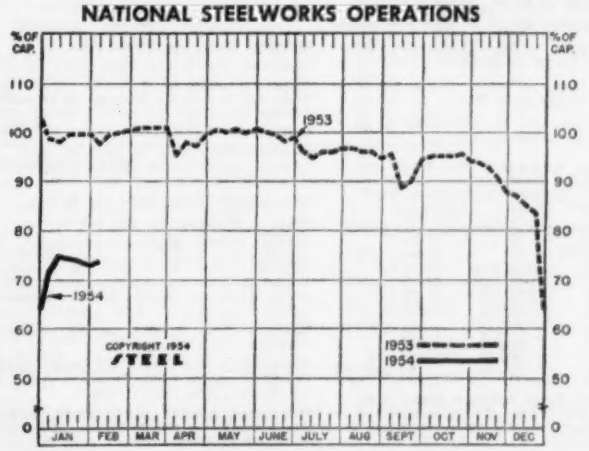
OUTLOOK—The larger number of working days in March also will most likely make that month's tonnage of steel output the largest for this quarter even though the daily rate of production remains steady. Thus far there is no evidence of an upturn in steel demand. Over-all it's constant. With demand less now than supply, buyers are ordering only for current needs and are insisting on immediate delivery. In some cases, steel users are said to be living off inventories yet. Because of these conditions, steel consumers are not inclined to order far in advance of needs. Consequently, steel producers are having difficulty getting a clue as to just how good March will be. Not only are March order books wide open, but there are still openings for February deliveries. Of course, you usually can find some exceptions. One leading producer of galvanized sheets was booked solidly on that product as early as the beginning of the month. In fact, galvanized sheets stand out now because of the strength of demand for them. This appears to be the result largely of seasonal influences: The spring demand from farms, the construction industry and the expanding air-conditioning industry.

ON THE LEVEL—Reflecting the rather constant demand for steel, output of steel for ingots and castings is moving in a sideways fashion. For the week ended Feb. 7, STEEL estimated production at 74 per cent of capacity, compared with 73 per cent in the preceding week. This yields approximately 1,765,000 net tons. This is 20 per cent below the output of 2,202,000 tons in the corresponding week of last year.

TIME OUT—One small producer of electric furnace steel closed down for February and will produce steel only in alternate months until business strengthens sufficiently to warrant production every month. Another company is producing ingots at only 10 per cent of capacity.

HOLDING FAST—Although the easiness in steel demand is accompanied by concessions on freight charges and some of the price extras by steel producers, the standard base prices are remaining intact. As a result, STEEL's price composite on finished steel holds at $113.91 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Feb. 7	Change	Same Week 1953	Same Week 1952
Pittsburgh	85	— 1*	106.5	10[illegible].5
Chicago	83.5	0*	92	102
Mid-Atlantic	76	— 5	97	99
Youngstown	63	— 7	106	106
Wheeling	75	+ 2	100	100
Cleveland	79	— 4*	103.5	98
Buffalo	80.5	+ 9.5	106	104
Birmingham	80.5	— 6.5	96	104
New England	65	+10	89	90
Cincinnati	66.5	— 5	93	77
St. Louis	36.5	—11.5	105.5	85
Detroit	82	— 1.5	101.5	106
Western	80	+ 1	110	100
Estimated National Rate	74	+ 1	97.5	100

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,384,549 net tons in 1954; 2,254,459 tons in 1953; 2,077,040 tons in 1952.

The Metalworking Outlook—p. 59 Technical Outlook—p. 107

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Feb. 2

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.563	Pipe, galv., buttweld (100 ft)	17.567	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.880	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.583	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.799
Bars, tool steel, alloy, oil hardening die (lb)	0.506	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.065
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb)	1.075	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193	‡Not available.	
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.243				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Feb. 2 1954	Jan. 26 1954	Month Ago	Jan. Average
(1947-1949=100)	141.3	141.3	141.4	141.4

STEEL's FINISHED STEEL PRICE INDEX

	Feb. 4 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	151.86
Index in cents per lb	5.140	5.140	5.140	4.913	4.114

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Feb. 4 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$113.91	$113.91	$113.91	$110.98	$97.77
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	46.69
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.22
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	27.83	28.17	29.67	43.00	40.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Feb. 4 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	2.95	2.45
Bars, H.R., Chicago	4.15	4.15	4.15	2.95	2.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	2.85	2.275
Shapes, Std., Chicago	4.10	4.10	4.10	2.85	2.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.75-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.475-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ⅜-⅝", Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Feb. 4 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.25	50.30
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	60.16	60.16	60.16	59.75	50.80
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$29.50	$30.50	$30.50	$44.00	$41.00
No. 1 Heavy Melt, E. Pa.	27.00	28.00	29.50	41.50	42.00
No. 1 Heavy Melt, Chicago	27.00	27.00	29.00	42.50	39.00
No. 1 Heavy Melt, Valley	28.50	29.50	29.50	44.00	37.75
No. 1 Heavy Melt, Cleve.	26.50	28.50	28.50	43.00	37.25
No. 1 Heavy Melt, Buffalo	25.00	25.00	27.50	43.00	44.00
Rails, Rerolling, Chicago	36.50	38.00	39.50	52.50	56.00
No. 1 Cast, Chicago	29.50	32.50	32.50	43.00	47.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

DAILY NONFERROUS PRICE RECORD

	Price Feb. 4	Change		Previous Price	Jan. Avg.	Dec. Avg.	Feb. 1953 Avg.
Copper	29.50-30.00	Oct.	20	29.00-30.00	29.750	29.750	25.136
Lead	12.80	Jan.	18	13.30	13.060	13.300	13.300
Zinc	9.50	Jan.	18	10.00	9.760	10.000	11.431
Tin	85.25	Jan.	27	85.00	85.100	84.913	121.500
Nickel	60.00	Jan.	14	56.50	60.000	60.000	60.000
Aluminum	21.50	July	15	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar.	9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, deld.; Magnesium 99.8%, Freeport, Tex.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 12.80, chemical 12.90, corroding 12.90, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 46c, 100 to 4000 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

Mercury: Open market, spot, New York, $188-$191 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz. from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 85.25.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.35 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+% hydrogen reduced, $5.85. Treated ingots $7.95.

Zinc: Prime western 9.50, brass special 9.75, intermediate 10.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 10.85, special high grade 11.00, die casting alloy ingot 14.00, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00. (Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 19.50-20.50; No. 12 foundry alloy (No. 2 grade) 18.50-19.50; 5% silicon alloy, 0.60 Cu max., 21.75-22.75; 13 alloy, 0.60 Cu max., 21.75-22.75; 195 alloy 20.75-21.25; 108 alloy 19.75-20.25; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.25-21.00; grade 2, 19.00-19.75; grade 3, 18.25-19.00; grade 4, 16.50-17.50.

Brass Ingot: Red brass, No. 115,24.50; tin bronze No. 225, 35.25, No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.00 per cwt; pipe, full coils $18.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

	NICKEL, "A" Nickel	MONEL, Monel	INCONEL, Inconel
Sheet, C.R. ...	88.5	67.5	92.5
Strip, C.R. ...	92.5	70.5	98.5
Plate, H.R. ..	84.5	66.5	90.5
Rod, Shapes ..	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb) Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.5
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.2	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	56.1

* 72-180 in. lengths. † 36 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. widths or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.2	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.33b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	41.66	42.26	44.62	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	23.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90% ...	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 11.00; low copper clippings 11.00; mixed clippings 9.00-10.00; old sheet 8.00-9.00; borings and turnings 5.50; pistons and struts 5.50; crankcases 8.00-9.00; industrial castings 8.00-9.00.

Copper and Brass: Heavy copper and wire, No. 1 22.00; No. 2 copper 20.00; light copper 18.00; No. 1 composition red brass 15.50-16.00; No. 1 composition turnings 14.75-15.25; mixed brass turnings 9.50-10.00; new brass clippings 15.50-16.00; No. 1 brass rod turnings 10.50-11.00; light brass 8.50-9.00; heavy yellow brass 11.00-11.50; new brass rod ends 13.00; auto radiators, unsweated, 11.00-11.50; cocks and faucets 13.00-13.50; brass pipe 14.50-15.00.

Lead: Heavy 9.50; battery plate 5.00-5.50; linotype and stereotype 12.00; electrotype 10.50; mixed babbitt 11.00-11.50.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 22.00-24.00; old sheet 20.00-22.00; turnings 14.00-16.00; rods 22.00-24.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.25; new die cast scrap, 3.00; old die cast scrap, 3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 13.00-13.50; 51S, 52S clippings 13.00-13.50; 14S, 17S, 24S clippings 11.50-12.25; mixed clippings 11.50-12.00; old sheet 10.00-11.00; old cast 10.00-11.00; clean old cable, free of steel 13.00-13.50; borings and turnings 10.50-11.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 24.00; No. 2 copper 22.50; light copper 21.00; refinery brass (60% copper) per dry copper content 20.00; auto radiators, 13.75, nominal.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 24.00-24.50; No. 2 copper 22.50-23.00; light copper 21.00-21.50; No. 1 composition borings 17.00; No. 1 composition solids 17.50; heavy yellow brass solids 13.50; yellow brass turnings 12.50; radiators 13.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.035; 200-499 lb $1.02; 500-999 lb $1.015; 1000 lb or more $1.01.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-5000 lb 11.35; 5000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 67.2; 100-500 lb 53.2; 700-1900 lb 50.7; 2000-9900 lb 49; 10,000 lb or more 47.8.

Stannous Chloride (Anhydrous): Less than 50 lb $1.521; 50 lb $1.181; 100-300 lb $1.031; 400-900 lb $1.007; 100-1900 lb 98.2; 2000-4900 lb 94.6; 5000-19,000 lb 86.5; 20,000 lb and over $2.4.

Stannous Sulphate: Less than 50 lb $1.223; 50 lb 92.3; 100-1900 lb 90.3; 2000 lb and over 88.3.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

The cry for more titanium still comes from Washington. Not only is more of the metal wanted, but strengthening of domestic sources is sought

HUE and cry from Washington for more titanium is still in full force.

Source of most of it: The Senate Interior Subcommittee on Domestic Ores, chairmanned by Sen. George W. Malone (Rep., Nev.), which is investigating strategic materials. A number of strong views have emerged in testimony, but few concrete proposals for getting more and cheaper titanium quickly. For short-range titanium outlook, see p. 69.

Developments—Calling for yearly production of 150,000 tons of titanium for the military alone, Senator Malone believes domestic mines should be strengthened to supply U. S. needs because much of our titanium ores still comes from India and Australia, which could be cut off in wartime. The Defense department, which is making a five-year study of titanium needs, calls estimated military needs for titanium, recently revised upwards to 22,000 tons, "unrealistic."

The subcommittee, disturbed by slowness in solving problems of extracting the strategic metal in volume, wants the federal government to encourage establishment of a civilian titanium industry as firmly as other basic metals. Office of Defense Mobilization told the senators it has set up a committee to study titanium development and report on needs. General Services Administration said it is prepared to approve titanium processing contracts as fast as they are found necessary by ODM. GSA is known to have had negotiations on titanium with Electro Metallurgical Co., Dow Chemical Co., Monsanto Chemical Co., Horizons Inc., National Research Corp. and Western Pyromet Co.

Contract—One move announced by GSA is an agreement with E. I. du Pont de Nemours & Co. Inc. to begin design and engineering studies preliminary to possible construction of a plant to produce 7000-8000 tons of titanium yearly. Pointing out that "while there is no agreement that the plant will be built," GSA Administrator Edmund F. Mansure said, "The data are needed so we will be able to conclude negotiations with the company for additional production." Maximum outlay on engineering work is $600,000, to be completed by next September. The plant, if built, would cost $30 million to $35 million, and would be located between Waverly and Camden, Tenn., adjoining a TVA steam power plant.

Should the Du Pont plant be built, capacity would still be well below targets. Contracts to date are with Du Pont (13,500 tons over a five-year period), Titanium Metals Corp. of America (18,000 tons over a five-year period), Cramet Inc. (6000 tons yearly, to commence in 1956) and Bureau of Mines (180-250 tons over an 18-month period).

STEEL's Metal Price Averages for Jan., 1954
(Cents per pound)

Electrolytic Copper, del. Conn.	29.750
Lead, St. Louis	13.060
Prime Western Zinc, E. St. Louis	9.760
Straits Tin, New York	85.100
Primary Aluminum Ingots, del.	21.500
Magnesium, Freeport, Tex.	27.000
Nickel, f.o.b. refinery	60.000

Record—In 1953, titanium sponge production was 2241 short tons and titanium pigment production increased 6 per cent, according to Bureau of Mines statistics. Domestic ilmenite output of 481,000 tons was a 9 per cent decrease, but imports were higher. Domestic rutile output showed a slight increase over 1952, but imports were lower.

Early Adjustment

Anticipated 10-per-cent cut in mine output of copper in the first quarter is already largely fulfilled as the third big U. S. producer, Anaconda Copper Mining Co., announced a cut in work week at its Montana mines from six days to five. Cutback amounts to about 10 per cent, or 700 tons less refined copper. Kennecott and Phelps Dodge previously announced cutbacks in the West.

All cuts announced are at old properties. Several new mines will be in operation this year, supported by government floor price contracts. American Smelting & Refining Co.'s Silver Bell, Ariz., mine will go in within six months. Floor price is 24.5 cents and annual capacity is 18,000 tons. Phelps Dodge has its Lavender Pit, Ariz., mine scheduled for production about the same time at an annual output of 38,000 tons and supported by a floor price of 22 cents. Anaconda's Yerington, Nev., operation is now in full swing. Company is guaranteed 25.5 cents a pound. Yearly production is about 30,000 tons.

Cadmium Price Drops

Slash of 30 cents a pound on cadmium sticks and bars and 40 cents a pound on platers' shapes finally came last week. It was caused by competition from imports at lower prices plus lagging demand in consumers' hands and sizable stocks in producers' bins. During 1953, cadmium sellers saw stocks shoot up about 65 per cent. Five-ton lots of sticks and bars are now priced at $1.70 a pound. Patented shapes are quoted at $1.75 a pound, reducing differential between the two forms by 10 cents.

It Pays To Yell

Modified stockpile goal for nickel or alteration in rate of accumulation is a possibility hinted at by BDSA. Clamor for more nickel from electroplaters led the agency to announce that 1954 civilian supplies will not be below 1953 levels. All but a small portion of the nickel now being produced with government assistance is going to the stockpile.

Nonferrous Briefs

- Price reductions were made effective Feb. 1 on 63 aluminum alloy extruded shapes by Aluminum Co. of America. Harvey Aluminum Division, Harvey Machine Co., made a general reduction in prices of extruded aluminum alloys effective the same date.
- American Smelting & Refining Co., with sizable lead operations in Australia, is now selling refined lead in California on par with the St. Louis basing price, or $4 a ton below New York level.
- Reynolds Metals Co.'s new $34-million aluminum reduction plant in Arkadelphia, Ark., is now operating.

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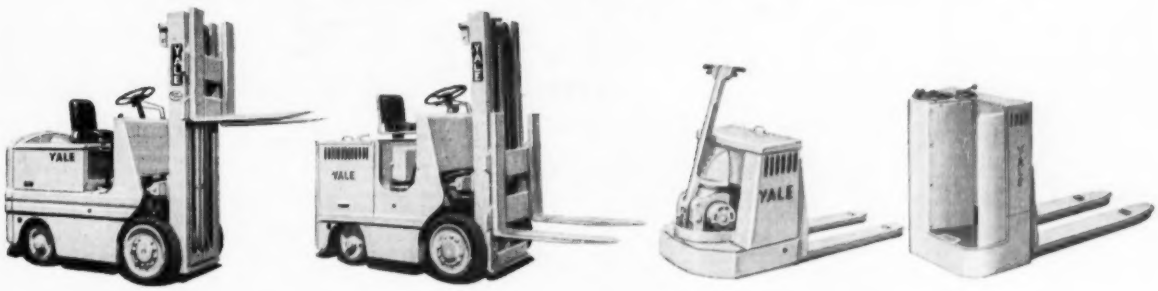

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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 175. Key to footnotes, page 177.

—SEMIFINISHED—

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana, Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 .....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna, N.Y. B2 .75.50
LosAngeles B3 .....94.50
Munhall,Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2, U5, W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ..94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ...101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ...82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5, W14 82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ...113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ...$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity, Ala. R2..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ..4.775
Monessen,Pa. P7 .....4.725
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ...5.176
Portsmouth P12 .....4.525
Roebling,N.J. R5 ....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 ....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 ....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14..4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 ....5.10
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.95
So.Chicago,Ill. U5 ....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 ....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ...6.175
Ind.Harbor,Ind. Y1 ...6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 ....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 ....4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 ....4.20
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 ....4.20
Conshohocken,Pa. A3 ..4.25
Ecorse,Mich. G5 .....4.30
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1.4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
LoneStar,Tex. L6 .....4.50
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14..4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1.4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif. (30) K1..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14..6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 ....5.55
Coatesville,Pa. L7 ....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14..5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill U5 .....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland,l.c.l.(15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

—BARS—

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ..4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran., Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 .....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.075
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ..5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb., Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; S. SHAPES, H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.40
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.00
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ...5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13 .5.20
Hartford,Conn. R2 .....5.75
Harvey, Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 .....5.75
Massillon,O. R2, R8 ...5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa. (17) B4..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 .....5.45
Putnam,Conn. W18 .....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ..6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finishing Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 .....6.325
Carnegie, Pa. C12 .....6.325
Chicago W18 .....6.325
Cleveland A7, C20 ....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2, M13.6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ...6.775
Massillon,O. R2, R8 ...6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 ....6.525
So.Chicago,Ill. R2, W14.6.325
SpringCity,Pa. K3 .....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ....6.625
Youngstown F3, Y1 ...6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.40
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.00
Seattle B3, N14 .....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling, Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.80
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3 .....5.85
So.SanFrancisco B3 ....5.85
SparrowsPt. ½-1" B2 ..5.55
Williamsport,Pa. S19 ..5.45

RAIL STEEL BARS
Avis,Pa.(4) J8 .....4.25
ChicagoHts.(3,4) C2 ....4.15
ChicagoHts.(3,4) I-2 ....4.15
FortWorth,Tex.(26) T4 ..4.65
Franklin,Pa.(3,4) F5 ....4.15
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 4.15
Tonawanda(3,4) B12 ....5.00
Williamsport,Pa.(3) S19.4.50
Williamsport,Pa.(4) S19.5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 ...10.40
McK.Rks.(D.R.) L5 ...14.00
McK.Rks.(Staybolt) L5.15.50

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ...3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....4.025
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1.3.925
Irvin,Pa. U5 .....3.925
Kokomo,Ind. C16 .....4.025
Lackawanna,N.Y. B2 ..3.925

Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ...4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ...3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ...3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ...3.925

SHEETS, H.R. (19 gage)

AlabamaCity, Ala. R2..5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 .....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ...5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G6 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 .....5.90
SparrowsPoint(36) B2 ..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 .....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ...4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 .....4.775
Fairless, Pa. U5 .....4.875
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2,Y1.4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low Alloy

Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1.7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ...5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 .....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2..5.275
Steubenville,O. W10 ...5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ...5.525
Canton,O. R2 .....6.025

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.475	6.925
Fairfield T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O. W10	6.075	....
Pitts.,Cal. C11	6.825	....
SparrowsPt, B2	6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.575
Fairfield,Ala. T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind. C16 ....5.925†
Niles,O. N12 .....5.825

†Based on 5c zinc

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.875
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 ..7.30
Follansbee(23) F4 ....7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 .....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 .....3.925
Bridgeport,Conn.(10)S15 4.15
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1.3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.525
Lackw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ....5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2..3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 .....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3 6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.45
Bridgeprt,Conn.(10) S15.5.75
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.65
Detroit D2, M1, P20....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ...5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ..5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 .....5.45
NewBedford,Mass. R10 .6.00
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5...5.45
NewHaven,Conn. A7 ....6.20
NewHaven,Conn. D2 ....5.90
Pawtucket,R.I. N8, R3..6.30
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(20) R6 .....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 ....6.30
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
Pawtucket,R.I.(11) N8.12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2 ..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.06

STRIP, Electrogalvanized

Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American CladmetalsCo.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Poliak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 StainlessWeldedProducts
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.09C	1.06-1.35C
Spring Steel (Annealed)					
Berea,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) SI5	6.75	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80	....	....
Detroit D2	5.65	7.85	8.45	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) SI5	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.55	10.65	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I. (11) N8	...	7.65	8.60	10.55	12.85
Pawtucket,R.I. (12) N8	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7, T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	...	12.50	....	....
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.50	15.00	18.00

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	8.75	9.75	10.65
Brackenridge,Pa. A4	....	....	8.75	9.75	10.65
Granite City,Ill. G4	....	....	8.55	9.80	....
IndianaHarbor,Ind. I-2	7.85	8.15	8.75	9.75	....
Mansfield,O. E6	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	7.85	8.15	8.75	9.75	....
Vandergrift,Pa. U5	....	8.15	8.75	9.75	10.65
Warren,O. R2	7.85	8.15	8.75	9.75	....

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semi processed ½c lower)	Field	Armature	Electric	Motor	Dynamo
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*	....	....
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40
Zanesville,O. A10	....	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9	11.60	....	....	....
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville,O. A10	12.35§	12.90§	13.40§	14.40§

C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.25	16.75	....
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O. R2	....	....	....	....	12.35‡

*Semiprocessed. †Fully processed only §Coils; cut lengths ½c lower. ‡Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor, Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 Coke (Base Box)	lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt., Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8" Coils)	
Alton,Ill L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo, W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark, Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(48)K4	6.775 7.30
Buffalo W12	6.675 7.075†
Cleveland A7	6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Jacksonville,Fla. M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	6.775 7.175†
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48)C10	7.625 8.025**
Spar'wsPt.B2(48)	6.775 7.325*
Sterl'g(1)(48)N15	*6.675 7.175*
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	145
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	*142*

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WIRE, Barbed	Col.
AlabamaCity R2	153**
Aliquippa J5	150*
Atlanta A11	158
Bartonville,Ill. K4	158
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	176**
SparrowsPoint,Md. B2	158*
Sterling,Ill. (1) N15	*155*

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE, (16 gage)	An'ld. Galv. Stone	Stone
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.40
Buffalo W12	12.50	....
Cleveland A7	12.50	....
Crawfordsville M8	12.50	14.30
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mass.W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45*
Sterling(1) N15	*12.50*	*14.25*
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa.	A3..$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	...	...	....	....	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	....	..	....	..	....	....	....	....	....	....
Etna, Pa. N2 (†)	...	...	....	....	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3	...	...	....	....	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
Fontana, Calif. K1 (§)	...	...	....	....	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	....	....	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	....	....	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	—0.25	19.50	+4.25	12.5	+8.5	....	..	....	..	....	....	....	....	....	....
Sharon, Pa. M6	...	...	....	....	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20	34.75	21
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	....		....		....		26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
Youngstown Y1 (††)	...	...	....	....	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25	....	34.75	....	34.75	....	25.75	....	25.75	....
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	21.5	36.75	21	36.75	21	....	....	....	....
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.31	18.44
1¼	13	....	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2¼	12	37.10	44.75	32.41
2½	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	.....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary,Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	....	....	....	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	....	....	...(16)	5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.70
Steelton,Pa. B2	4.325	4.225	....	...
Williamsport,Pa. S19	....	....	....	5.20
TIE PLATES				
Fairfield,Ala. T2	.....5.125			
Gary,Ind. U5	.....5.125			
Ind.Harbor,Ind. I-2	...5.125			
Lackawanna,N.Y. B2	..5.125			
Minnequa,Colo. C10	..5.125			
Pittsburg,Calif. C11	...5.275			
Seattle B3	.....5.275			
Steelton,Pa. B2	.....5.125			
Torrance,Calif. C11	..5.275			
TRACK BOLTS (20) Treated				
Cleveland R2	.....11.00			
KansasCity,Mo. S5	....11.00			
Lebanon,Pa. B2	.....11.00			
Minnequa, Colo. C10	...11.00			
Pittsburgh O3, P14	....11.00			
JOINT BARS				
Bessemer,Pa. U5	....5.275			
Fairfield,Ala. T2	.....5.275			
Ind.Harbor,Ind. I-2	...5.275			
Joliet,Ill. U5	.....5.275			
Lackawanna,N.Y. B2	..5.275			
Minnequa,Colo. C10	..5.275			
Steelton,Pa. B2	.....5.275			
AXLES				
Ind.Harbor,Ind. S13	....6.50			
Johnstown,Pa. B2	.....6.50			

STANDARD TRACK SPIKES	
Ind,Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	....7.30
Lebanon,Pa. B2	.....7.05
Minnequa,Colo. C10	....7.05
Pittsburgh J5	.....7.05
Seattle B3	.....7.55
So.Chicago,Ill. R2	....7.05
Struthers,O. Y1	.....7.05
Youngstown R2	.....7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
7/16-in. under .....26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 4
⅝-in. & ⅝-in. 5
¾-in. and larger ... 3
Longer than 6 in.:
All diams. ..... +4
Lag bolts, all diams.:
6 in. and shorter.... 12
Over 6 in. long. 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts ..... List
Boiler & Fitting-Up Bolts 23

NUTS

H.P. & C.P., regular & heavy:
Square, all sizes 58
H.P., Hex, regular & heavy:
¾" and smaller 58
⅞" to 1⅛", inclusive. 60
1¼" to 1½", inclusive 62
1⅝" and larger 58
C.P. Hex, regular heavy:
All sizes 58
Hot Galv. Nuts (all types):
¾" and smaller 40
⅞" to 1½", inclusive. 43
Finished Hex Nuts:
New standard, all sizes 58
Semifinished & Slotted Hex.:
Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)
1 in. diam. x 6 in. and shorter 34
1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)
No. 10 and smaller 34
¼-in. diam. & larger .. 14
N.F. thread, all diams... 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)
Plain finish .....47.5 & 10
Plated finishes ..... 30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)
6 in. or shorter:
⅝-in. & smaller 38
¾-in. through 1 in. .. 22
Longer than 6 in.:
⅝-in. and smaller ... 20
¾-in. through 1 in. .. 7

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 2 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter. 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(33) To jobbers, deduct 20c
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 16 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6.7 gage.
(49) T-post; deduct 2 cols for U-post.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed.	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)..	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns.	83.00-148.00
Aluminum: Atomized, 500 lb drums, freight allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots.	32.00*
Brass, 20-ton lots.	29.25-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Magnesium	75.00-85.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	43.50
Solder	8.50*
Stainless Steel, 302 ...	91.00
Tin	14.00*
Zinc, 10-ton lots.	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over...	4.95
Less than 1000 lb ..	5.10
Chromium, electrolytic 99.9% Cr min.	3.60

*Plus cost of metal.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co, Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	3.875
18.25	4.25	1	4.75	...	2.160-2.320
18	4	2	9	...	2.515
18	4	2	....	...	1.640
18	4	1	....	...	1.480
13.5	4	3	....	...	1.735
6.4	4.5	1.9	....	5	1.005-1.055
6	4	3	....	6	1.240
2	1.4	1.2	....	...	0.495
1.5	4	1	....	8.5	0.865-0.895

Tool Steel producers include: A4, A8, H2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., deld. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld	57.37	57.87	57.87	58.37
McKeesRocks, deld.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wimerding,Monaco, deld.	57.66	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	....	63.00	63.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt, allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

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	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.64	7.78	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.27	6.71	7.36	6.56	7.60	12.12	6.93	6.80	7.80
Erie, Pa.	6.13	...	8.15	6.38	...	6.23	7.50[6]	....	6.50	6.36	7.79
Houston	7.15	7.60	9.40	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
JerseyCity,N.J.	6.54	7.45	8.42	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.17	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43[6]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43[6]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.17	7.13	7.90	7.02	8.80	6.87	8.19[6]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	8.15	8.70	9.40	7.90	...	7.60	10.65	....	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40[2]	9.80	7.60	...	7.60	10.55[8]	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; [2]—500 to 9999 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Distributors Intensify Sales Effort

Absence of large tonnage orders coupled with full inventories and steady flow of products from mill sources, force sellers to seek small-order business more agressively

Chicago—Now in the best position inventory-wise for the past several years, steel warehouses are becoming more aware of the necessity for seeking business aggressively. Big tonnage orders have evaporated now that almost every product is in free supply at mill level. Current buying once more is small order type for immediate use.

Philadelphia—Warehouses expect February volume to better that of January. It has the same number of working days insofar as industry is concerned and distributors are confident there will be some gain in demand as spring approaches. Historically, March is one of the best months of the year. On an average bu ss was down in January compared with December.

New York—Warehouse tonnage is off although orders are numerous. Most are small, however, reflecting hand-to-mouth consumer buying. Distributors expect marked improvement in volume during March. Demand for wide flange beams is active. Most flat-rolled items and bar products are slack. With inventories in balance warehouses are ordering only replacement tonnage.

Pittsburgh—With warehouses holding nearly-complete inventories, distributors aren't doing much buying. Distributors report continued interest among fabricators in plate and wide flange beams. Certain structural shapes are easing in supply.

Sales in January were estimated at 40 per cent below volume one year ago. To build up sales, warehouses are striving for smaller orders.

Cincinnati—Z bars and other slow demand items are showing up in warehouses as they continue to fill out their inventories. Business remains slow.

Seattle—Unfavorable weather conditions restricted warehouse order volume last month, but the total exceeded that of January 1953. Competition is keener. Because of im-

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.75	$4.85	$4.75	$5.00
Bar Size Angles	4.39	4.49	4.39	4.67
Structural Angles	4.39	4.49	4.39	4.67
I-Beams	4.39	4.49	4.39	4.67
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.00	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.65	4.75	4.65	4.93
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Channels	4.49	4.59	4.49	4.77
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

proved mill supply conditions, warehouses are carrying smaller inventories. With water deliveries from the East coast in 90 days, lower stock investment is possible. Distributors find it advisable to carry fewer items.

The price situation in the Seattle district is stable but cut prices are encountered in territory served from either Seattle or Portland. This reflects recent lower prices prevailing at Portland. The situation is expected to clear up when the Portland area has worked off surplus imported steel.

Los Angeles—Some warehouses report January sales lagged behind December volume as much as 20 per cent. Distributors say the downtrend that started in November now shows some signs of reversing itself. Warehouses are rounding out stocks, now reported 90 to 100 per cent normal. Wide flange beams are still in short supply.

Rails, Cars . . .

Track Material Prices, Page 177

New York—New York Central railroad's award of 2500 box cars to the Despatch Shops Inc., East Rochester, N. Y., a subsidiary, is the largest to be placed in the East in some time.

Stainless Steel . . .

New York—Shipments of stainless steel products (exclusive of tonnage shipped to industry members for further conversion) declined in November, reports the American Iron & Steel Institute. Tonnage moved in the month amounted to 37,792 net tons, comparing with 48,203 tons in October and with 53,067 tons in November, 1952.

In the first 11 months last year shipments of stainless totaled 566,627 net tons. This was an increase compared with 449,394 tons in the like period of 1952. Comparative product shipment data follow:

Shipments of Stainless Steel Products
(Net Tons)

Products	11 Mos. 1953 Net Shipments	11 Mos. 1952 Net Shipments
Ingots	22,477	18,484
Blooms, slabs, etc.	18,520	16,599
Wire rods	6,010	5,612
Structurals (heavy)	326	76
Plates	27,644	24,542
Bars, hot-rolled	41,688	43,190
Bars, cold-finished	53,528	45,310
Mechanical tubing	5,195	6,184
Pressure tubing	14,647	11,663
Wire, drawn	29,549	27,443
Sheets, hot-rolled	15,045	23,053
Sheets, cold-rolled	113,524	95,796
Strip, hot-rolled	3,708	3,245
Strip, cold-rolled	214,744	128,163
All other	22	34
Total	566,627	449,394

Sheetmakers Looking Ahead To March

Increase in orders anticipated by mills as first quarter advances. Consumers are buying cautiously with relatively prompt deliveries available in most items

Sheet and Strip Prices, Page 174 & 175

Boston — Slight improvement in flat-rolled steel orders, mostly for prompt shipment, does not support the assumption normal peacetime production push will come with March.

The procurement pattern more and more resembles that of 1939 before the World War II tonnage flood. More steel is turned over with capacity up substantially, but consumers are buying only what they can sell in the form of finished fabricated products.

New York—Sheet business is coasting, except in galvanized, demand for which product is improving. One eastern mill is booked solidly on galvanized sheets for February.

Base prices continue steady. However, freight absorption is increasingly general.

Philadelphia — Galvanized sheets appear in relatively best demand in flat-rolled. One producer is booked solidly through February. Producers of most products can still take more February tonnage, including hot and cold-rolled sheets and certain sheet specialties.

District television manufacturers will require about 100,000 color tubes this year. What percentage of this number will be of steel and what portion glass cannot be determined.

Pittsburgh—Cold-rolled sheet orders are increasing, but not enough to indicate a trend. While some automakers are backing optimistic predictions with sizable orders, others are living off inventories.

Over-all outlook is for some discouragement in February sales, followed by a pickup in March. Production in March promises to be the heaviest in first quarter.

Cleveland—Sheet mills are booked up pretty well into late February and some business is being placed for March shipment. Volume, however, is disappointing with consumers ordering sparingly, and largely on a month-to-month basis. Some users still are working off inventories, which, with manufacturing operations reduced are lasting much longer than the mills had anticipated.

Expectations are February volume will better that of January, with March business rising to a peak for the quarter.

Chicago—Seemingly, sheet users generally underestimated size of their inventories because they are still managing to live off them pretty well.

St. Louis — Sheet demand shows little improvement. Appliance and farm equipment interests, big factors in the sheet market in this area, are reluctant to increase their inventories, and are buying hand-to-mouth.

Birmingham—Much of the demand pressure for sheets has gone but reliable reports are that there is not sufficient tonnage for all takers.

Los Angeles—Activity at mill level has quickened. Water heater manufacturers, who previously had large inventories and were out of the market, are asking sheetmakers for early delivery of February and March orders.

Bridging the Valley

This is one of 72 bridges which is being erected by American Bridge Division, United States Steel Corp., Pittsburgh, for West Virginia's turnpike

Semifinished Steel . . .

Detroit—Great Lakes Steel Corp. has effected an adjustment in its operations resulting in temporary furloughing of approximately 1800 employees. Workers hired after Jan. 1, 1951 are principally affected. The merchant bar mills maintained to handle special orders, one of the

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company's four blast furnaces, and bessemer converter operations have been shut down temporarily.

Youngstown—District steel ingot rate was down to 63 per cent of capacity last week due to curtailed steelmaking operations at Youngstown Sheet & Tube Co.'s Brier Hill Works for rebuilding of the blooming mill. Two bessemers, 40 open hearths and 14 blast furnaces are operating in the area.

Structural Shapes . . .

Structural Shape Prices, Page 174

Boston—Demand for wide flange beams continues strong but supply is improving. Standard structurals now balance requirements. Looming are heavier offerings of foreign shapes. Morrisville, Pa. works will be rolling structural bar shapes next month and in second quarter Phoenix Iron Co. will be producing 10-inch flange beams. Two to three weeks shipment is prevalent on angles and channels.

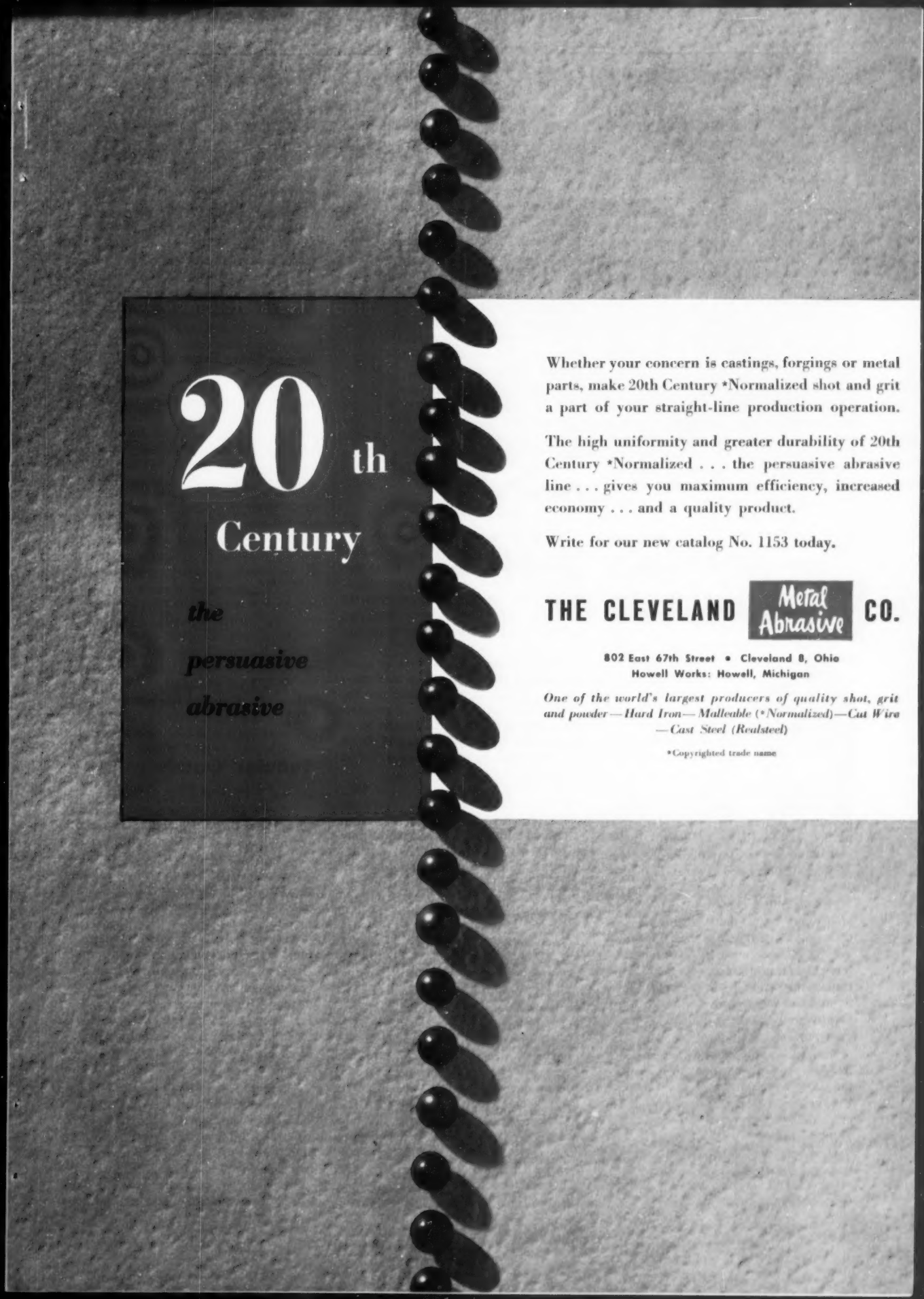
Outstanding structural activity includes 16,785 tons for Maine turnpike bridges; 87 are beam spans with Ernst Iron Works, Buffalo, low on 60 units, 13,206 tons. Sharing are Bancroft & Martin, Portland, Me., 17 bridges, 1740 tons, and Phoenix Bridge Co., 6-span continuous plate girder, Androscoggin river, 1840 tons.

New York—Structural market activity is spotty. While there has been a flurry or two, demand since the first of the year has been definitely off. This is traceable largely to seasonal influences and, to some extent, to the fact substantial tonnage was placed in December.

There is hope for an upturn as spring approaches. Most tonnage for the New York state thruway has been let, but there is considerable tonnage remaining for branches and connections. This is particularly true in this area on projects south of Tarrytown, N. Y. Much miscellaneous state highway business is in prospect. Further, an increasing amount of school work is scheduled, as well as a variety of jobs that usually come out in periods of more settled weather.

Philadelphia — More structural work is being figured, especially small jobs, but it is not reflected currently in heavier bookings. Most fabricating shops are operating at a good rate.

Pittsburgh — Consumers of wide flange beams remain on quota from mills, but supply bottlenecks are ending. Construction companies say



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they can obtain standard shapes without too much difficulty.

Demand remains strong for all shapes, with roadbuilding projects accounting for a sizable proportion of business.

Seattle—Small jobs are increasing. Several large projects are close to placement. Unconfirmed report is circulating to the effect Bonneville will buy 2200 tons of tower steel from a Texas firm.

Steel Bars . . .

Bar Prices, Page 174

Cleveland—Bar mills are diversifying their production to a greater extent than a year ago, now rolling the complete range of sizes. More small angles and flats, for example, are being rolled in relatively small lots, now that large order demand for larger sizes has dried up so noticeably. Such rolling, of course, necessitates more roll changes and resulting higher production costs, but at the same time diversification of product is serving to fill gaps in rolling schedules.

Republic Steel Corp. has issued a revised list of extras on hot-rolled carbon steel bars and small shapes, effective Feb. 2, superseding the list issued Jan. 15, 1954.

Chicago—Bar demand can be described as listless. Seemingly, it is at a lower level than actual consumption which suggests inventories are still supporting requirements. There is a slight quickening in output of spring lines of farm equipment but automotive, on the other hand, is slipping off.

New York—Bar business is largely hand-to-mouth. Producers believe February rollings will be about on a parity with January but add if there is any difference it will be in favor of the current month. March should show some improvement.

Philadelphia—One large producer of carbon bars believes production this month will equal that of January, and may even be a shade better. Other mills look for fairly sustained operations. In no case does it appear facilities will be pressed to any extent.

Pittsburgh—Although carbon bar orders show only slight increase for February, cancellations are declining. Production remains steady. Producers expect sales to automakers, cold drawers and warehouses to gain in March.

Declining demand for wrought iron has cut production at a bar iron plant in this area to about 50 per cent of capacity.

Wire . . .

Wire Prices, Page 176

New York — Heavier automotive demand is confined largely to Ford and Chevrolet orders. Buying of high carbon specialties and spring wire lags behind expectations. February schedules are open on numerous items.

Cleveland — Manufacturers wire items are reported moving fairly well, including cold-heading wire. Consuming demand, however, is far from satisfactory, and producers still are in receipt of order cancellations. Merchant trade is reported slightly improved but has not got the steam behind it of former years.

Chicago—Wiremakers find it necessary to push for sales of wire for construction use. This despite the fact that spring demand for the material is expected to be heavy.

Plates . . .

Plate Prices, Page 174

Philadelphia — Plate inquiry is quiet. Most mills have open capacity for February. At least three are operating below normal production. Producers see little improvement over the next few weeks. Building activity may contribute to a pickup in March.

Approximately 40,000 tons of steel, principally plates, shapes and bars for the hull, will be required for the new supercarrier of the Forrestal-class placed last week with the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., on a bid of $117,750,000.

The Navy also has placed a $53,022,000 contract for three Sherman-class destroyers with the Quincy, Mass., shipyard of the Bethlehem Steel Co., and has awarded a third contract for a new type of tank landing ship to the Bath Iron Works, Bath, Me., at a cost of $14 million.

Boston — Although mid-March is earliest delivery from some mills, plate buying is hand-to-mouth with prompt shipments stressed. Bookings are slightly heavier.

New York—Plate requirements are spotty with March specifications coming out slowly and most eastern mills able to book additional tonnage for February. Ship work is enlivened a bit by placing of 10 deck scows and 20 covered freight barges by the New York Central railroad with the Staten Island yard of the Bethlehem Steel Co. This yard also received a contract for one deck scow from the Central Railroad of New Jersey.

Pittsburgh—Mill quotas are now removed from all but a few sizes of light plate, and consumers are becoming more insistent on quick delivery and good quality. Mills are expected to make delivery on shorter notice.

Incoming orders for heavy plates are steady, with little prospect of improvement or decline. Light plate demand remains good.

Seattle — A labor dispute has served to limit operations at many plate fabricating shops of late. The larger plants have sizable backlogs. Steel is in improved supply. Awards last week involved about 500 tons of plates.

Revise Some Export Prices

New York — United States Steel Export Co. has established new export base prices on certain items with freight included to New York, Philadelphia and Baltimore, effective with shipments from producing mills Jan. 27. The new schedule follows:

American standard pipe T & C	
Buttweld, 2½ and 3 in.	
Black	33.945% discount
Galvanized	18.195% discount
Buttweld, 3½ and 4-in.	
Black	24.945% discount
Galvanized	8.695% discount
Seamless	
Galvanized	
2-in.	Plus 4.94% discount
2½-in.	Plus 2.94% discount
3-in.	Plus 0.44% discount
3½ and 4-in.	1.06% discount
5-in.	0.31% discount
6-in.	2.81% discount
Galvanized plain wire	$7.37 per 100 lbs.
Barbed wire	
Lyman 4-pt. 5-in.	$7.23 per 80 rod spool
Glidden 4-pt. 3-in. or 6-in.	8.36 per 100 lbs.
Iowa 4-pt. 3-in. or 6-in.	8.36 per 100 lbs.
Waukegan 4-pt. 3-in. or 6-in.	8.46 per 100 lbs.

Tubular Goods . . .

Tubular Goods Prices, Page 177

Pittsburgh—Due to a reduction in zinc price, Sawhill Tubular Products Inc., Mercer Pipe Division, Sharon, Pa., reduced its prices on galvanized steel pipe. Affected are sizes ½-inch to three inches inclusive. Discounts were increased half a point to one point.

Orders remain slow for buttweld pipe, with no change in sight. Mechanical and pressure tubing producers are subject to heavy competition. Demand for seamless grades is holding up well, with scattered cancellations clouding the outlook. Brisk sales are reported in oil country casing and tubing.

Cleveland — Some seamless mills are booked full through first half, reflecting continued strong demand for oil country goods. On the other hand standard buttweld pipe is moving sluggishly and is available for prompt shipment from 4-inch down.

Seattle—Cast iron pipe market ac-

tivity is picking up with several major contracts pending. Billings, Mont., placed orders for pipe and fittings totaling nearly $450,000. Awards are pending at Portland, Oreg., and Spokane, Wash. Additional business is expected out shortly.

Pig Iron . . .

Pig Iron Prices, Page 178

New York—Pig iron shipments are easier. January merchant volume failed to come up to yearend predictions and there are no signs of an uptrend this month. The decline in business reflects lower operating rates at district foundries. These average lower than the pre-holiday levels.

Shops are currently averaging 3 to 4 days weekly. Certain smaller shops are doing no better than 2 days a week.

Some foundrymen think the likely turning point will come in April, though others believe it may come in March. With operations lagging there is little pressure for building up inventories. One leading iron seller reports January sales down 50 per cent from a year ago.

New York—Production of pig iron and blast furnace ferroalloys set a record in 1953 at 75,842,759 net tons, reports the American Iron & Steel Institute. This was an increase of nearly 13.7 million tons over output in 1952, and 4.6 million tons more than the previous record production set in 1951.

Last year's output of pig iron and blast furnace ferroalloys was 95.5 per cent of blast furnace capacity, comparing with 84.2 per cent in 1952, and 98.3 per cent in 1951.

Boston—Foundries, not averaging more than 4-days weekly, are not producing at capacity for that rate. Most shops with contracts for Everett pig iron are not taking the tonnage they are allotted. Mystic furnace is operating on reduced draft, and with a substantial stockpile could meet any sudden and heavy demand handily.

Buffalo—Pig iron production has slumped to 80 per cent of capacity in this district. Mixed tendencies mark trading in merchant iron. The foundry melt is well below normal.

Hanna Furnace Corp. last week adjusted its operating schedules in line with the current slackening in demand. No. 1 blast furnace was banked resulting in some temporary layoffs. No. 3 furnace was blown out Dec. 1 but at that time no layoffs were effected.

Philadelphia—There are few bright

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spots in the merchant iron market. Pressure pipe producers are stepping up requirements. Two in this area are working double shift. The general run of foundries, however, particularly jobbing shops, find business slow.

Pittsburgh—U. S. Steel Corp. blew in its No. 4 blast furnace at the Homestead Works Jan. 29.

Cleveland — Sluggish demand for merchant pig iron persists though some improvement in foundry operations is reported since opening of the new year. General jobbing foundry operations are noticeably spotty. Automotive castings shops also are not as active as had been anticipated. On the other hand, shops on machine tool castings are doing well.

Chicago—Farm equipment makers are accelerating output of implements a little, particularly spring lines, but that is about the only encouraging facet of pig iron demand. Order volume for castings from other industries is either barely holding its own or slipping further.

Birmingham—Pig iron producers are not being pushed for tonnage, although some improvement in demand is reported over that of December.

Scrap . . .

Scrap Prices, Page 200

Cleveland—In the absence of representative sales the scrap market in this district continues in the doldrums. Some small sales of miscellaneous material, classified as No. 2, were reported at up to $25, unprepared, last week but they were not considered indicative of the market trend. Generally, prices are largely nominal with current published quotations representing a drop of about $2 per ton from those last published for the Cleveland market in STEEL. Actually, the currently published list prevailed a week ago, being established when industrial lists were closed after STEEL had gone to press.

That the market has not yet hit bottom is apparent. While $26 to $27 appears to be the generally quoted price on No. 1 heavy melting steel, scrap interests concede the mills would have no difficulty getting offers $1 or more under that price were they to enter the market for substantial tonnage. Other grades, including cast iron items, are correspondingly weak.

Boston—Consumer steel scrap inventories are maintained at comfortable levels despite slow buying. Shipments on contracts balance consumption with district ingot operations

(*Please Turn to Page* 188)

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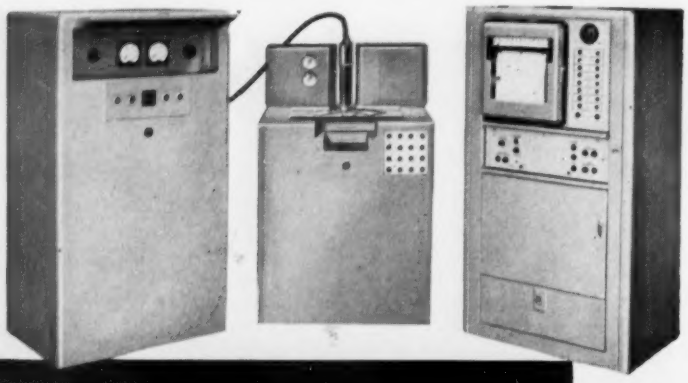

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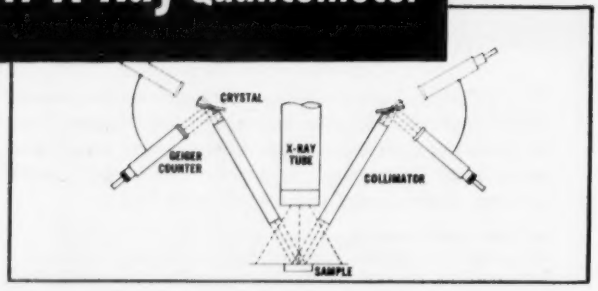

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Scrap . . .

(*Continued from Page* 187)

fluctuating somewhat below the national average. Several consumers are limiting purchases within areas taking $4 to $5 freight.

New York—Weakness dominates the local scrap market and while the major steel grades are nominally unchanged, it appears trading would lead to still lower prices. Even under prevailing conditions brokers have dropped buying prices on machine shop turnings to a nominal spread of $7 to $8, mixed borings and short turnings to $10 to $11, low phos structural and plate to $25 to $26, and short shovel turnings to $11 to $12. Cast iron grades are moving in fair volume with prices unchanged.

Buffalo — Weaker tendencies and pessimism dominate the scrap market here. Dealers report no buying interest but prices are nominally unchanged.

Philadelphia — Business in steel scrap continues at a virtual standstill, but prices appear a little steadier. Some trade interests believe the market is nearing bottom.

Cast grades show fair strength. Heavy breakable cast is stronger at around $36.50 to $37.50, delivered consumer plant.

Among the few reductions in steel scrap is a nominal drop of $1 a ton in electric furnace bundles to $29, delivered consumer plant. Couplers, springs and wheels are off slightly to $33, and rail crops, 2 feet and under, are lower at $40 to $41.

Pittsburgh — Small purchases of scrap depressed prices of most grades. Prospect of reduced steel operations in February limits demand. No. 1 heavy melting is quoted at $29 to $30, a drop of $1 in the last week. Blast furnace, cast iron and railroad grades fell $1 to $2.

Washington—Consumption of ferrous materials (scrap and pig iron) during November decreased 9.4 per cent from October, reports the Bureau of Mines.

Total consumption during the month was 10,389,000 tons, of which 5,065,000 tons were scrap and 5,324,000 tons pig iron. This compares with October melt of 11,362,034 tons, of which 5,628,568 tons were scrap and 5,733,466 tons pig iron.

Stocks of scrap held by consumers at the end of November totaled 6,085,000 gross tons, a slight increase compared with 6,053,429 held at the end of the preceding month.

Cincinnati — Local buying took place in No. 2 heavy melting and No. 2 bundles, taking these prices out

(*Please Turn to Page* 190)

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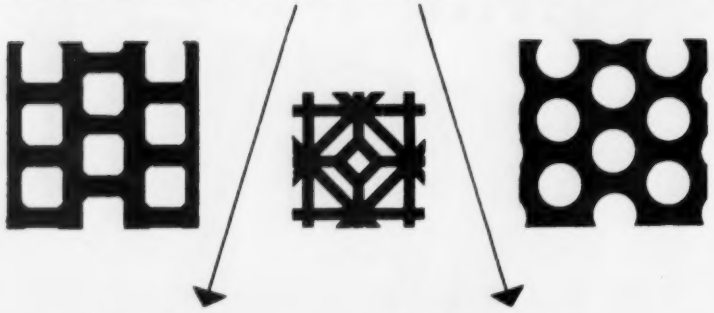

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Scrap . . .

(*Concluded from Page* 188)

of the nominal category. The prices of $20 to $21 a ton for No. 2 heavy melting and $18 to $19 for No. 2 bundles are $2 and $1 a ton, respectively, below the previous nominal quotations. These are the lowest prices for these grades in years.

Detroit — Open-hearth grades of scrap continue soft in this market with prices largely nominal. In the face of fading steel operations at some major mills, observers see little upturn ahead. Increased activity is noted in cast iron grades, however.

Chicago—General sagging of scrap prices occurred as the aftermath of the limited purchase by a leading steel mill of No. 1 heavy melting and No. 1 factory bundles for February delivery. These two items were off $2 a ton from previous sales and secondary grades declined roughly to the same extent. Blast furnace items are off $1, and cast grades are off $1 to $2.

St. Louis—Scrap market here received a mild fillip when Laclede Steel Co. and Granite City Steel Co. placed small February orders. Price uncertainty and 60 to 90-day ground stocks have curtailed buying by the steel mills in recent months. Reduced furnace operations indicate buying restraint will continue this month.

Birmingham—Scrap remains inactive in this district. As has been the case for weeks, most of the melting steel moving is finding a market elsewhere.

The report in the Jan. 25 issue of STEEL to the effect Luria Steel & Trading Corp. was withdrawing from the South was in error. While the company is closing its Birmingham office it is continuing to operate in the South, covering the territory from its Chicago and St. Louis offices.

Los Angeles—While scrap is moving again and a somewhat firmer tone is noted in the market, prices are $2 to $3 per ton lower. Effective Feb. 1, No. 1 heavy melting steel is quoted $20, No. 2 heavy melting, $16, No. 1 bundles, $19, No. 2 bundles, $16. Machine shop turnings are $2 lower at $5. No. 3 bundles, little used in this district, range $14 to $17. With little demand for foundry grades, No. 1 cupola ranges from $35 to $38.

San Francisco — An across-the-board markdown of $2 to $4 a ton in steel scrap prices has been posted by mills in this district. Prime grades were slashed $3 a ton.

Seattle—Scrap is moving slowly as larger buyers are well stocked and are out of the market.

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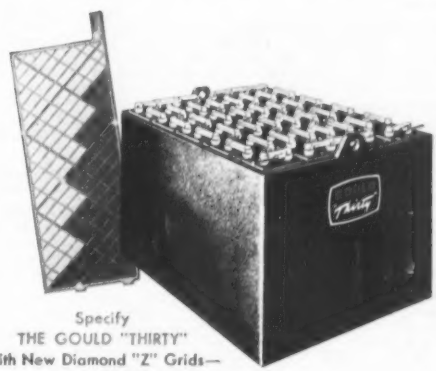

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr, 36-39%, Si 26-39%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contact, carload, lump bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 010% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ⅛ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more, $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max.). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%), Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr. 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

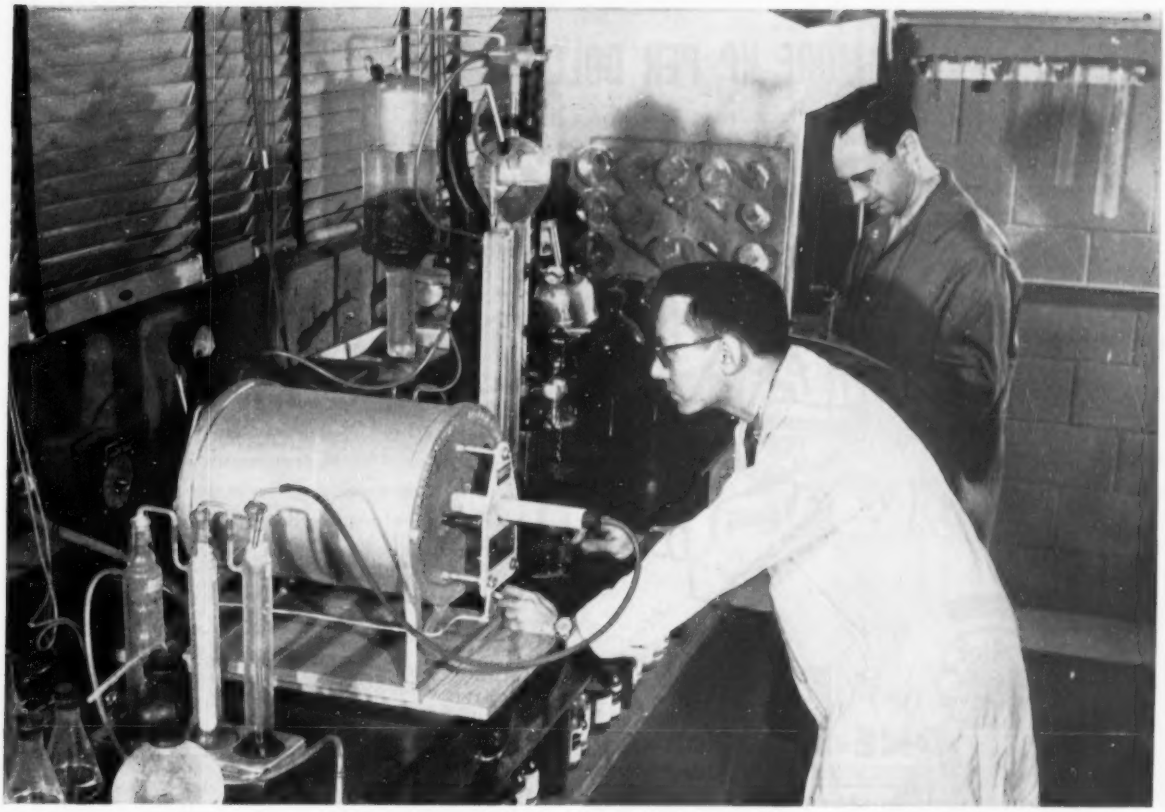
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.



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From the original formula to the ingot, control is the most important item in our book. *Alloymet 2115* and its companion alloys are products pre-alloyed to take the "headache" out of the melting department. A single trial in your mill will make you an *Alloymet* "regular."

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Alloy Metal Division
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★ MORE HP PER DOLLAR

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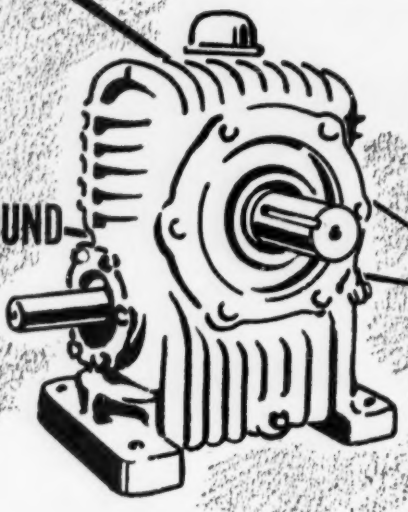
★ MORE HP PER POUND



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Division, Michigan Tool Company

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REVCO SUB-ZERO CHESTS

Temperatures as low as -95° BELOW ZERO

For Shrink Fits

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Seasoning Gauges and Precision Tools

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For Tests

Completely equipped ready for operation. The 1.5 Cu. Ft. model as shown handles parts or assembled units up to 23" long, 12½" deep x 9" high and the 6.5 Cu. Ft. model up to 47" lengths, 16" deep x 15" high. Revco Sub-Zero Chests meet highest performance standards featuring temperatures of 95° and 85° below zero while running continuously in normal room temperatures. Other controlled low-temperatures readily attained.

REVCO RIVET COOLER for aircraft application is equipped with 90 rivet canisters in six convenient removable racks. Operates efficiently at temperatures as low as minus 35° F.

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BROWNING ELECTRIC TRAVELING CRANES AND HOISTS up to 125-TON CAPACITY

VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

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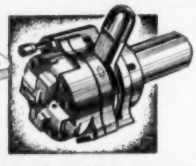

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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ARCHITECTURAL GRILLES
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DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	22.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite min. 60%, WO_3	23.80
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.12 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $1.05-$1.07.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mb content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 Per Cent: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 Per Cent St. Louis, Mexico, Vandalia, Mo. $223.00; Danville, Ill., $213.20.

70 Per Cent St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-47
Birmingham area	$45.00†

† With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam. (Inches)	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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wire rope

Engineered for safety

In making Upson-Walton extra flexible crane rope, materials and manufacturing practices meet exacting specifications. Slings are factory assembled from Upson-Walton wire rope and Upson-Walton fittings.

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Manufacturers of
WIRE ROPE • FITTINGS • TACKLE BLOCKS
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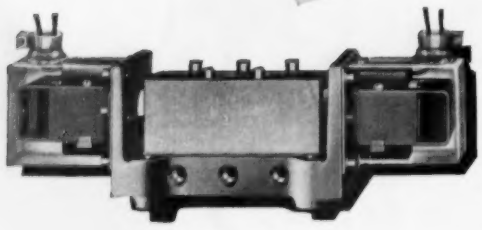
AIR AND HYDRAULIC
Control Valves

FEATURE THIS MONTH

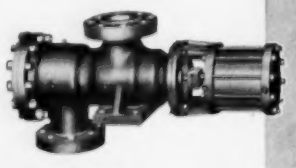


1/8" and 1/4" Double Solenoid Valves

Their reduced amperage requirement simplifies electrical circuits

● These valves are extremely simple in design — but ruggedly built — and will give millions of cycles of efficient, trouble-free, dependable operation. For air to 125 psi, vacuum, or low pressure hydraulic service. Up to 300 cycles a minute. Solenoid armature bears directly against the valve plunger eliminating levers, links, pins, etc. Low amperage requirement simplifies the electrical circuit. The valve is reversed by energizing first one solenoid, then the other. The valve and both solenoids are mounted on an aluminum base, and can be removed independently without disturbing the piping. 2-way, 3-way, double 2-way, 4-way and 5-way actions.

also the following

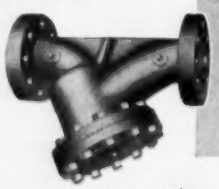


DESCALING VALVES

Specially designed for descaling hot strip and large steel forgings. Widely used. 2" to 6" sizes. Capacities to 1550 Gals./Min. Design eliminates destructive water hammer and reduces hydraulic shock to a minimum.

HIGH PRESSURE STRAINERS

Used ahead of descaling valves to prevent foreign material from plugging spray nozzles causing scale streaks in strip—also in hydraulic lines to protect valves, cylinders, and other machinery. 1½" to 6" sizes. Highly efficient. Easily cleaned.



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25 TO 50 TON CAPACITY

DIESEL • GASOLINE • ELECTRIC • STEAM

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MASTER MAKERS OF FINE BEARING METALS SINCE 1860

A. W. Cadman Mfg. Co.

28th and SMALLMAN STS., PITTSBURGH 22, PA.

Iron Ore . . .

Washington—U. S. production of iron ore last year was record-breaking at 119.2 million gross tons. Shipments at 118.6 million tons were up 2 per cent. Lake shipments totaled 95.7 million tons. All-rail movement from the Lake Superior ranges was down, but exceeded 2.5 million tons.

The Lake Superior district accounted for 80.6 per cent of total tonnage, Southeastern states 6.4 per cent, Northeastern states 5 per cent, Western states 7.5 per cent. Byproduct ore was less than 1 per cent of the total tonnage.

Alloy Steel . . .

New York—Production of alloy steel, including stainless, was 10,238,345 net tons of ingots and steel for castings in 1953, reports the American Iron & Steel Institute. This was the highest for any year outside the three all-out war years, 1942-44. The 1953 production was 1.1 million tons greater than in 1952 and 100,000 tons above output in 1951.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 174

Los Angeles—Substantial tonnages of reinforcing steel will be required for large projects coming off the shelf for bids this month.

Seattle—District rolling mill operations are sustained. New business placed last week was in excess of 1300 tons.

Canada . . .

Toronto, Ont.—Pig iron production in Canada during November amounted to 254,643 net tons, comparing with 265,346 in October and 225,490 in November, 1922. For the 11 months ending November, output was 2,791,743 net tons against 2,449,333 in the like 1952 period.

Production of steel ingots and castings in November totaled 332,703 net tons, and compared with 362,498 during October and 306,274 in November, 1952. During the first 11 months of last year production amounted to 3,810,039 net tons, comparing with 3,380,459 in the same period of 1952.

Steel capacity at the beginning of 1953 totaled 3,936,100 net tons, of which 2,948,900 tons were basic open hearth, 682,000 electric, and 305,200 steel castings. At the end of the year capacity had risen to 4,979,600 net tons divided as follows: Basic open hearth, 3,951,300 net tons; electric, 714,400; steel castings, 313,900.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

13,206 tons, 60 beam span bridges, Maine turnpike extension, Ernst Iron Works, Buffalo, low contracts 207B and 207C.

2200 tons, tower steel, reported awarded Anchor Metals Inc., Hurst, Tex., $631,954, by Bonneville Power Administration.

1840 tons, 6-span continuous plate girder bridge, Maine turnpike extension, Androscoggin river, to Phoenix Bridge Co., Phoenixville, Pa., bids direct.

1740 tons, 17 beam span bridges, Maine turnpike extension, contract 207A, to Bancroft & Martin Rolling Mills Co., Portland, Me.

800 tons, 4-span riveted plate girder bridge, Merrimack river, Manchester, N. H., to Bethlehem Steel Co., Bethlehem, Pa., through Marinucci Bros. & Co. Inc., Boston, general contractors.

750 tons, plant addition, Owens-Illinois Glass Co., Bridgeton, N. J., to Belmont Iron Works, Eddystone, Pa.; similar tonnage is pending for another addition.

550 tons, rebuilding Port Angeles, Wash., plant for Rayonier Inc., to Leckenby Structural Steel Co., Seattle.

500 tons or more, Victory Memorial bridge, Cumberland river, Nashville, Tenn., to Nashville Bridge Co., Nashville, Tenn.

280 tons, Silver Lake regional high school, Kingston, Mass., to Builders Iron Works, Somerville, Mass., through Jefferson Construction Co., Cambridge, Mass., general contractor.

250 tons, junior high school, Marblehead, Mass., to Groisser & Schlager Iron Works, Somerville, Mass.; Park Construction Co., Inc., Boston, general contractor.

200 tons, shop building, C. S. Bird & Son, Inc., North Charleston, S. C., to Savannah Machine & Foundry Co., Savannah, Ga.; Cecil's Inc., Spartanburg, S. C., general contractor.

195 tons, incinerator, Worcester, Mass., to Builders Iron Works, Somerville, Mass.

STRUCTURAL STEEL PENDING

3000 tons, tower and substation steel; bids to Bonneville Power Administration, Portland, Oreg., Feb. 16 and Feb. 18, respectively.

2800 tons, cantilever hangar, Hanscomb Airfield Base, Bedford, Mass.; bids to Corps of Engineers, Boston.

1000 tons, Moses Lake, Wash., air field hangar; bids to U. S. Engineer, Mar. 10.

750 tons, plant addition, Owens-Illinois Glass Co., Bridgeton, N. J.; this is in addition to 750 tons placed for another extension.

600 tons, shop and office, Esso Standard Oil Co., Baltimore, bids closed.

400 tons, bakery addition, American Stores, Buffalo, bids Feb. 11.

200 tons, heating plant extension, Naval air station, Quonset Point, R. I.; bids in to Public Works Office, First Naval District, Boston.

170 tons, plant addition, Great Northern Paper Co., Millinocket, Me.

166 tons, state viaduct and approaches, New Brunswick, N. J., bids Feb. 23; also required are 186 tons of reinforcing steel and 6900 square feet of sheet steel piling and 3311 linear feet of steel H piles.

150 tons, state bridge, Northeast, Md., Wright Construction Co., Atlanta, awarded general contract.

136 tons, state bridge, Schuylkill county, Pennsylvania, bids Mar. 5.

REINFORCING BARS . . .

REINFORCING BARS PLACED

675 tons, Washington state building, Olympia, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; McDonald Building Co., Tacoma, Wash., general contractor.

250 tons, Fairbanks, Alaska, high school, to Northwest Steel Rolling Mills Inc., Seattle; Boen & Koon & Egge-Cummins, Seattle, general contractors, $2,215,000.

165 tons, 4-span truss bridge, Housatonic river, Brookfield-Bridgewater, Conn., to Bethlehem Steel Co., Bethlehem, Pa., through Mariani Construction Co., New Haven, Conn., general contractor.

150 tons, junior high school, Marblehead, Mass., to Joseph T. Ryerson & Son Inc., Cambridge; Park Construction Co., Boston, general contractor.

150 tons, Washington state crossing, Snohomish county, to Soule Steel Co., Seattle.

116 tons, Bureau of Reclamation Potholes project, Washington state, to Joseph T. Ryerson & Son Inc., Seattle.

100 tons, College of Puget Sound dormitory, Tacoma, Wash., to J. D. English Steel Co., Tacoma, Wash.

REINFORCING BARS PENDING

200 tons, 386-ft. state overpass, Broadwater county, Montana; general contract to F. L. Flynn & Co., Billings, Mont., $149,941.

186 tons, state viaduct and approaches, New Brunswick, N. J., bids Feb. 23; also 166 tons of structural steel plus sheet steel piling and steel H pile requirements.

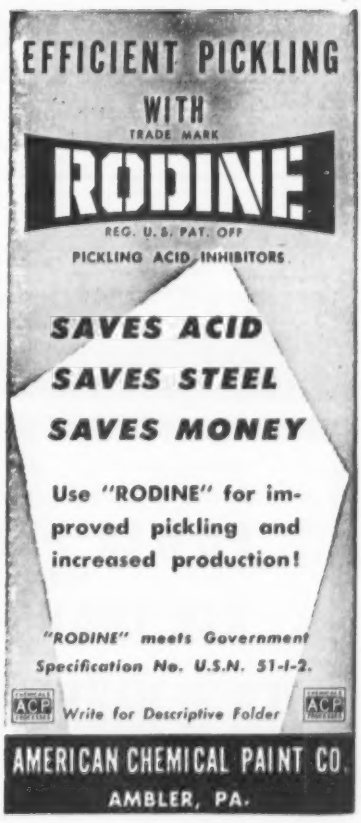
100 tons, 463-ft. Oregon state bridge, Washington county; general contract to Donald M. Drake Co., Portland, Oreg., $233,816.

PLATES . . .

PLATES PLACED

350 tons, water storage tank, Spokane, Wash.,

(*Please Turn to Page* 202)



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NO TROUBLESOME WORKING PARTS
to be affected by interior heat

IN OPERATION—

The full muffle swings from the superstructure and an automatic mechanical movement at the end of each stroke, advances the work.

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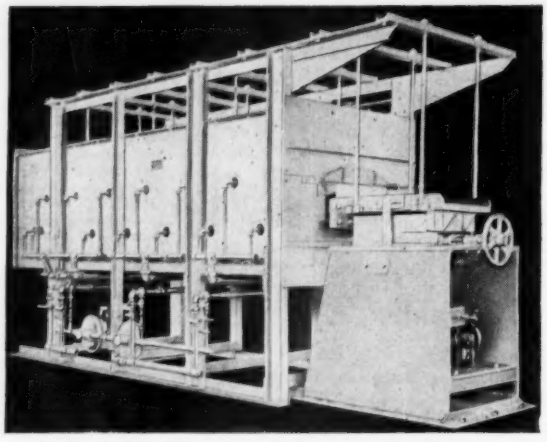
Tools, springs, chain parts, pins, screws, balls, nuts, stampings, ball-races, pen-points and instrument parts are some of the items economically, efficiently and dependably hardened in these furnaces.

*The Original Ammonia-Gas Case Hardening Process.



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This controlled Atmosphere Furnace is widely popular. It comes in five sizes ranging in capacity from 10 to 1200 lbs. per hour.

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996 LAFAYETTE STREET, ELIZABETH 4, N. J.

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If you need additional copies of this addenda sheet, circle No. 18 on the inquiry card, page 141

Additions to STEEL's Guide for STAINLESS STEEL Buyers

(Not Revisions)

WELDED TUBING

Round, Cold-Rolled

Stainless Types: 302, 304, 304L, 305, 309, 310, 316, 316L, 316Cb, 317, 321, 347, 430, and 430Ti
Produced at Wallingford, Conn., by the Wallingford Steel Co.

Wall Thickness (inches)	Outside Dimensions (inches)	Wall Thickness (inches)	Outside Dimensions (inches)	Wall Thickness (inches)	Outside Dimensions (inches)
.005-.035	.125	.010-.065	.625	.035-.095	1.375
.005-.042	.1875	.010-.065	.625	.035-.095	1.500
.007-.049	.250	.020-.083	.750	.035-.095	1.625
.008-.049	.3125	.020-.083	.875	.035-.095	1.750
.008-.065	.375	.020-.083	1.000	.035-.095	1.875
.010-.065	.4375	.025-.095	1.125	.035-.095	2.000
.010-.065	.500	.030-.095	1.250	.042-.156	3.000

Stainless Types: 304L, 309Cb, 310S cb, 314, 316Cb, 316L, 329, 405, 430, 430Ti, 442, 446
Produced at East Troy, Wis., by Trent Tube Co.

.006-.250* ..... ⅛ to 40

* Dependent on O.D.

Square, Cold-Rolled

Stainless Types: 302, 304, 304L, 305, 309, 310, 316, 316L, 316Cb, 317, 321, 347, 430, 430Ti
Produced at Wallingford, Conn., by the Wallingford Steel Co.

Check with the mill for sizes.

Stainless Types: 304L, 309Cb, 310S cb, 314, 316Cb, 316L, 329, 405, 430, 430Ti, 442, 446
Produced at East Troy, Wis., by Trent Tube Co.

up to .120 ..... up to 2

Rectangular, Cold-Rolled

Stainless Types: 302, 304, 304L, 305, 309, 310, 316, 316L, 316Cb, 317, 321, 347, 430, 430Ti
Produced at Wallingford, Conn., by the Wallingford Steel Co.

Check with the mill for sizes.

Stainless Types: 304L, 309Cb, 310S cb, 314, 316Cb, 316L, 329, 405, 430, 430Ti, 442, 446
Produced at East Troy, Wis., by Trent Tube Co.

up to .065 ..... up to 1x2

PLATES

Hot-Rolled, Sheared — No. 1 and No. 4 finishes

Produced at Baltimore by Eastern Stainless Steel Corp.

Thickness (inches)	Size Range (inches)	Thickness (inches)	Size Range (inches)	Thickness (inches)	Size Range (inches)
Stainless Types: 301, 302, 303, 304, 304L, 305, 321, 403, 405, 410 and 430					
3/16	30x450 to 90x450	7/16	30x450 to 170x200	3/4	30x450 to 160x175
1/4	30x450 to 100x450	1/2	30x450 to 170x200	1	30x355 to 140x155
5/16	30x450 to 100x450	9/16	30x450 to 170x210	1 1/4	30x285 to 130x130
3/8	30x450 to 130x340	5/8	30x450 to 170x200	1 1/2	30x235 to 120x120
Stainless Types: 308, 309, 316, 316L and 347					
3/16	30x450 to 90x350	7/16	30x450 to 140x250	3/4	30x450 to 160x175
1/4	30x450 to 100x375	1/2	30x450 to 170x195	1	30x355 to 140x155
5/16	30x450 to 100x400	9/16	30x450 to 170x175	1 1/4	30x285 to 130x130
3/8	30x450 to 130x300	5/8	30x450 to 170x170	1 1/2	30x235 to 120x120
Stainless Types: 310, 317 and 318					
3/16	30x450 to 60x450	5/16	30x450 to 90x350	5/8	30x450 to 100x300
1/4	30x450 to 70x425	7/16	30x450 to 90x375	3/4	30x425 to 100x250
5/16	30x450 to 80x400	1/2	30x450 to 100x350	1	30x300 to 100x196
		9/16	30x450 to 100x325		

IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commision, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Feb. 4	$27.83
Feb. 28	28.17
Jan. Avg.	29.05
Feb. 1953	43.00
Feb. 1949	38.48

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	26.00-27.00
No. 1 bundles	*29.00-30.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*29.00-30.00*
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	*15.00-16.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Cut structurals	*33.00-34.00*
Heavy turnings	*29.00-30.00*
Punchings & plate scrap	*32.00-33.00*
Electric furnace bundles	*32.00-33.00*

Cast Iron Grades

No. 2 cupola	35.00-36.00
Charging box cast	34.00-35.00
Heavy breakable cast	*31.00-32.00*
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	*42.00-43.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*30.50-31.50*
Rails, 2-ft. and under	*45.00-46.00*
Rails, 18-in. and under	*46.00-47.00*
Rails, random lengths	*38.00-39.00*
Railroad specialties	*33.00-34.00*

Stainless Steel Scrap

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	85.00-87.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	*22.00-23.00*
No. 1 bundles	*26.00-27.00*
No. 2 bundles	*20.00-21.00*
No. 1 busheling	*26.00-27.00*
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	*15.00-16.00*
Short shovel turnings	*15.00-16.00*
Cast iron borings	*15.00-16.00*
Low phos.	*27.00-28.00*
Alloy free, short shovel turnings	*17.00-18.00*
Electric furnace bundles	*27.00-28.00*

Cast Iron Grades

No. 1 cupola	*40.00-41.00*
Charging box cast	*28.00-29.00*
Stove plate	*35.00-36.00*
Heavy breakable cast	*24.00-25.00*
Unstripped motor blocks	*23.00-24.00*
Brake shoes	*32.00-33.00*
Clean auto cast	*42.00-43.00*
No. 1 wheels	*38.00-39.00*
Burnt cast	*29.50-30.50*
Drop broken machinery	*41.00-42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*28.00-29.00*
R.R. malleable	*40.00-41.00*
Rails, 3-ft. and under	*42.00-43.00*
Rails, 18 in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Cast steel	*33.00-34.00*
Railroad specialties	*33.00-34.00*
Uncut tires	*36.00-37.00*
Angles, splice bars	*40.00-41.00*
Rails, rerolling	*40.00-41.00*

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	*40.00-50.00*

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	*24.00-25.00*
Machine shop turnings	*13.00-14.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Low phos.	*29.00-30.00*
Electric furnace bundles	*29.00-30.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*30.00-31.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	27.00
No. 2 heavy melting	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
No. 1 busheling	27.00
Electric furnace bundles	*29.00*
Machine shop turnings	15.00-16.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	21.00
Structurals & plate	31.00-32.00
Heavy turnings	25.00
Couplers, spring, wheels	*33.00*
Rail crops, 2 ft & under	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	33.00-35.00
Heavy breakable cast	*36.50-37.50*
Unstripped motor blocks	28.00
Drop broken machinery	40.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	18.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	14.00
Mach. shop turnings nom	*7.00-8.00*
Mixed borings, short turnings nom.	*10.00-11.00*
Low phos. (structural & plate)	*25.00-26.00*
Short shovel turnings	*11.00-12.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	85.00-90.00
430 sheets, clips, solids	75.00-80.00
410 sheets, clips solids	65.00-70.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*16.00-16.50*
No. 2 heavy melting	*13.00-13.50*
No. 1 bundles	*15.00-15.50*
No. 2 bundles	*11.00-11.50*
Machine shop turnings	*5.00-5.50*
Mixed borings, turnings	*6.00-6.50*
Short shovel turnings	*9.00-9.50*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*23.00-24.00*
No. 2 heavy melting	*20.00-21.00*
No. 1 bundles	*23.00-24.00*
No. 2 bundles	*18.00-19.00*
No. 1 busheling	*23.00-24.00*
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	*13.50-14.50*
Short shovel turnings	*13.50-14.50*
Cast iron borings	*13.50-14.50*
Low phos., 18-in.	*31.00-32.00*

Cast Iron Grades

No. 1 cupola	37.00
Heavy breakable cast	32.00
Charging box cast	32.00
Drop broken machinery	44.00

Railroad Scrap

No. 1 R.R., heavy melt.	29.00-30.00
Malleable	32.00-33.00
Rails, 18-in. and under	43.00-44.00
Rails, random lengths	36.00-37.00

CHICAGO

No. 1 heavy melting	26.00-28.00
No. 2 heavy melting	*22.00-23.00*
No. 1 factory bundles	*28.00-29.00*
No. 1 dealer bundles	*25.00-26.00*
No. 2 bundles	*20.00-21.00*
No. 1 busheling	*26.00-28.00*
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	*10.00-11.00*
Short shovel turnings	*12.00-13.00*
Cast iron borings	*12.00-13.00*
Cut structurals, 3-ft	*30.00-31.00*
Punchings & plate scrap	*31.00-32.00*
Electric furnace bundles	*30.00-31.00*

Cast Iron Grades

No. 1 cupola	*29.00-30.00*
Stove plate	*24.00-25.00*
Unstripped motor blocks	19.00-20.00
Clean auto cast	36.00-37.00
Drop broken machinery	*34.00-35.00*

Railroad Scrap

No. 1 R.R. heavy melt	*29.00-30.00*
R.R. malleable	*37.00-38.00*
Rails, 2-ft. and under	*40.00-42.00*
Rails, 18-in. and under	*41.00-43.00*
Angles, splice bars	*35.00-37.00*
Rails, rerolling	*36.00-37.00*

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	*42.00*
430 turnings	nom. 25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*18.25*
No. 2 heavy melting	*17.00*
No. 1 bundles	*19.00*
No. 2 bundles	17.50
No. 1 busheling	*18.50*
Machine shop turnings	*7.00*
Mixed borings, turnings	*7.00*
Short shovel turnings	*10.00*
Punchings & plate scrap	*21.00*

Cast Iron Grades

No. 1 cupola	35.00
Charging box cast	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	30.00

BUFFALO

No. 1 heavy melting	24.50-25.50
No. 2 heavy melting	21.50-22.00
No. 1 bundles	24.50-25.50
No. 2 bundles	19.50-20.00
No. 1 busheling	24.50-25.50
Machine shop turnings	12.00-13.00
Mixed borings, turnings	14.00-14.50
Short shovel turnings	15.00-15.50
Cast iron borings	14.00-14.50
Low phos.	28.50-29.50

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	27.50-28.50
No. 1 machinery	32.50-33.50

Railroad Scrap

Rails, random lengths	31.50-32.50
Rails, 2 ft and under	36.50-37.50
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Cast iron borings	17.00-18.00
Short shovel turnings	17.00-18.00
Machine shop turnings	19.00
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	31.00-32.00
Plate and structurals	31.00-32.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	nom.
Rails, 2-ft. and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	27.00
No. 2 heavy melting	25.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings	11.00
Short shovel turnings	12.00

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	25.00
Heavy breakable cast	25.00
Unstripped motor blocks	25.00
Brake shoes	*35.00*
Clean auto cast	37.00
Burnt cast	26.00

Railroad Scrap

No. 1 R.R. heavy melt	30.00-31.00
Rails 18-in. and under	42.00
Rails, random lengths	35.00
Rails, rerolling	37.00-38.00
Uncut tires	*29.00-30.00*
Angles, splice bars	33.00-34.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	27.00
No. 2 heavy melting	23.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 3 bundles	15.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	12.00
Electric furnace, No. 1	36.00-38.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	35.00-37.00
Heavy breakable cast	25.00-32.00
Unstripped motor blocks	23.00
No. 1 wheels	38.00-40.00
Stove plate	29.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	*20.00*
No. 2 heavy melting	*16.00*
No. 1 bundles	*19.00*
No. 2 bundles	*16.00*
No. 1 busheling	*20.00*
Machine shop turnings	*5.00*
Mixed borings, turnings	*5.00*
Short shovel turnings	*9.00*
Cast iron borings	*9.00*
Ctu structurals	*25.00*
Heavy turnings	*9.00*
Punchings & plate scrap	*25.00*
Electric furnace bundles	*19.00*

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	*20.00*
No. 2 heavy melting	*16.00*
No. 1 bundles	*18.00*
No. 2 bundles	*16.00*
Machine shop turnings	*5.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*35.00-38.00*

HAMILTON, ONT.

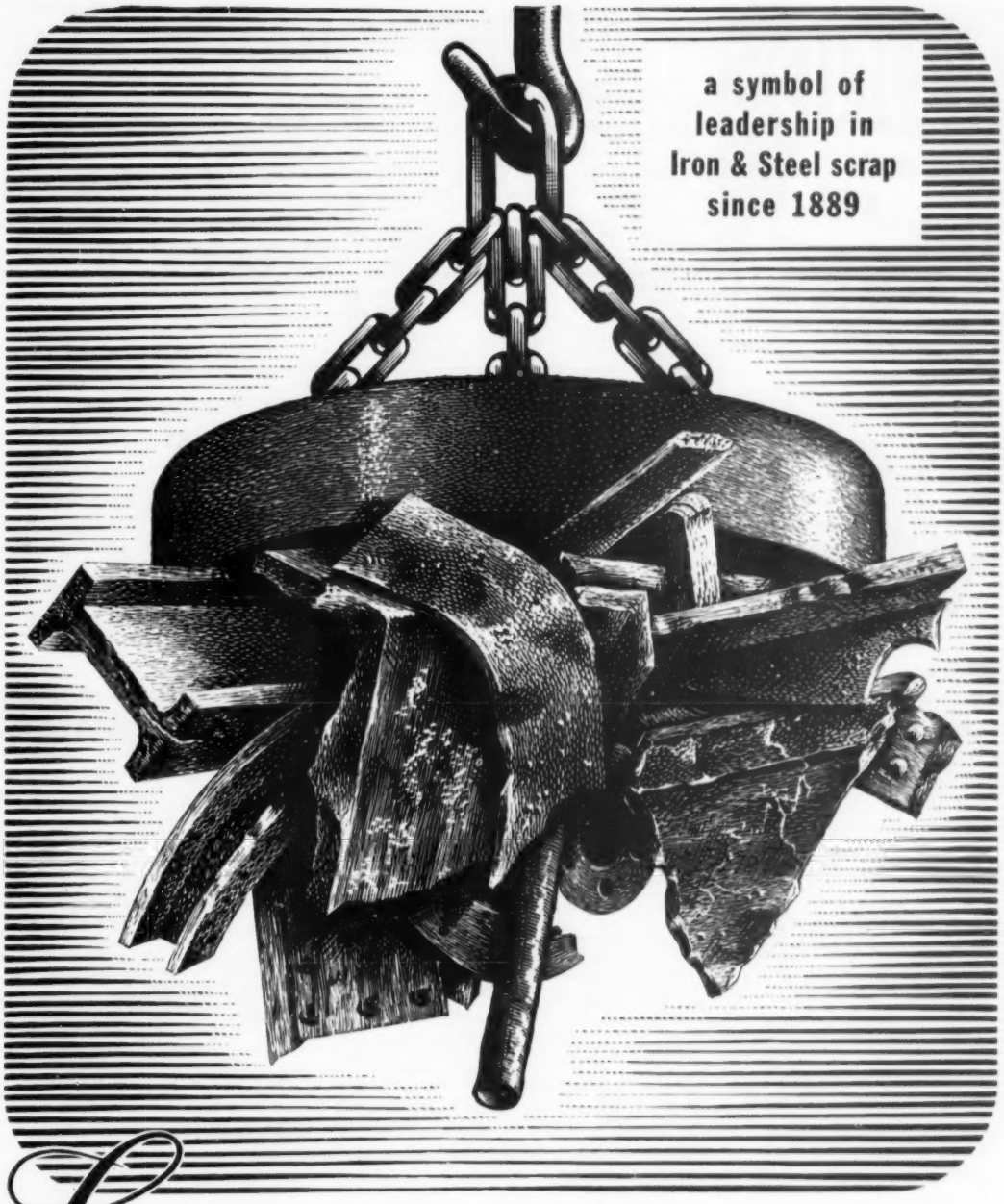
(Delivered prices)

No. 1 heavy melting	*$26.00*
No. 2 heavy melting	*23.00*
No. 1 bundles	*26.00*
No. 2 bundles	*21.00*
Mixed steel scrap	*20.00*
Mixed borings, turnings	*15.00*
Rails, remelting	*35.00*
Busheling new factory: Prepared	*24.00*
Unprepared	*20.00*
Short steel turnings	*15.00*

Cast Iron Gradest

No. 1 machinery cast	*42.00*

†F.o.b., shipping point.



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to Pittsburgh-Des Moines Steel Co., Seattle.

100 tons plus, water storage tank, Progress Water District, Portland, Oreg., to Chicago Bridge & Iron Co., Seattle.

PIPE . . .

CAST IRON PIPE PLACED

500 tons or more, various sizes, to U. S. Pipe & Foundry Co., Birmingham, Ala., $402,067, also fittings to American Cast Iron Pipe Co., $25,202; Pacific States Cast Iron Pipe Co., $7520; H. D. Fowler Co., Seattle, $38,717; by Billings, Mont.

300 tons, 24-inch, for Portland, Oreg., to American Cast Iron Pipe Co., Seattle.

150 tons, 6-inch mechanical joint, for Vancouver, Wash., to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

300 tons, 8, 6 and 4-inch and fittings; bids to Progress Water District, Portland, Oreg., Feb. 2.

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Missouri-Illinois, 100 seventy-ton covered hopper cars, to own shops.

New York Central, 2500 box cars, to its subsidiary, Despatch Shops Inc., East Rochester, N. Y.

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Ore Hoppers, All-Steel, 50-Ton, Heavy Duty
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THIS Ex-Cell-O transfer machine is in a famous automobile engine plant. Its job is precision boring of the main bearing line (held to 0.0005 inch tolerance), the cam line (held to plus or minus 0.001 inch) and the distributor bore. It is built to operate at top speed, with uniform precision and efficiency.

To avoid shutdowns for oiling and for bearing repairs that accompany haphazard methods of hand lubrication, a Farval automatic lubricating system was installed. Farval lubricates while the machine is in full operation, entirely eliminating downtime for oiling, increasing bearing life, and allowing higher machine speeds by keeping bearings cooler.

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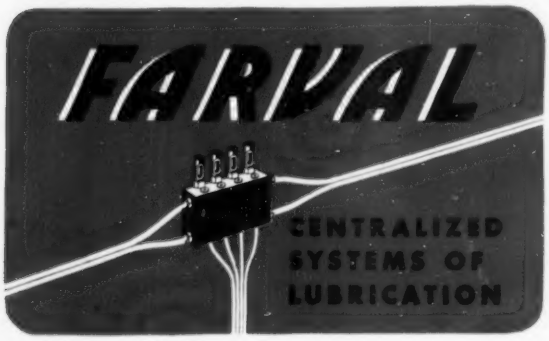
Today Farval protects millions of bearings in the automobile and allied industries, wherever equipment must be lubricated regularly and adequately to keep bearings on the job no matter how hard to get at.

Find out how Farval can help keep your equipment running continuously for maximum production. Write today for free Bulletin 26. The Farval Corporation, 3270 E. 80th St., Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Co., Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



FARVAL—*Studies in Centralized Lubrication*
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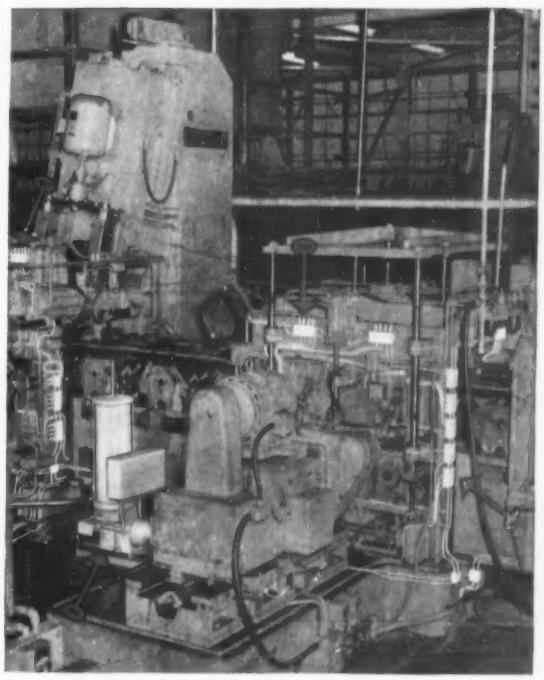

KEYS TO ADEQUATE LUBRICATION—Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine will be properly lubricated. Illustration by courtesy of Automotive Industries.

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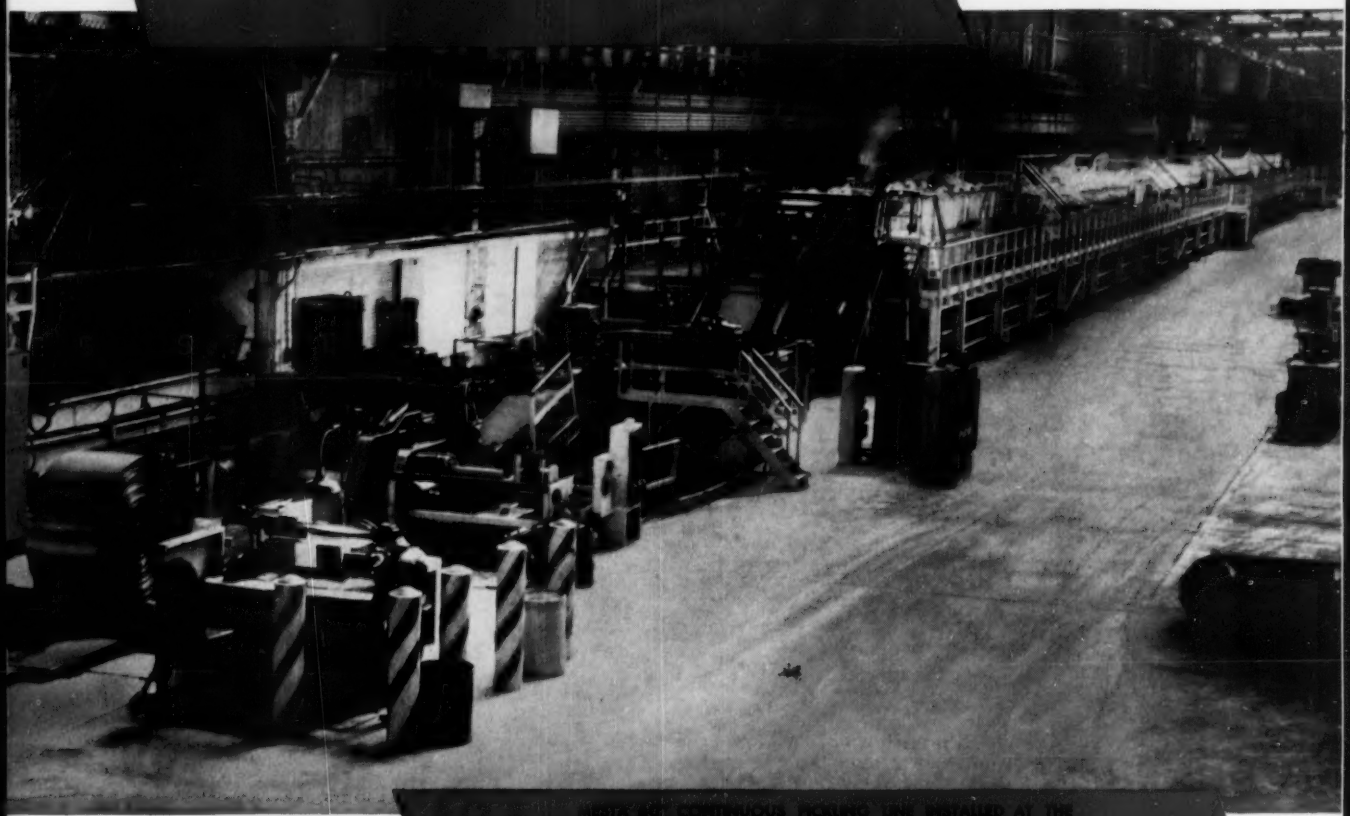
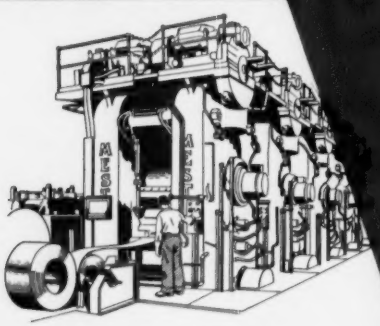


MESTA 60" CONTINUOUS PICKLING LINE INSTALLED AT THE INDIANA HARBOR WORKS OF THE INLAND STEEL COMPANY.



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